## INDEX

ABBE (Prof. Cleveland), the "Rollers" of Ascension and St.

Helena, 585
Abel (Sir Frederick, F.R.S.), Smokeless Explosives, 328, 352
Abercromby (Hon. John), a Trip through the Eastern Caucasus,

Abercromby (Hon. R.), the Motion of Dust, 406
Abney (Captain W. de W., F.R.S.), Photo-nephograph, 491
Abnormal Shoots of Ivy, W. F. R. Weldon, 464
Aborigine, a Surviving Tasmanian, Hy. Ling Roth, 105
Acetic Acid Solutions, Vapour-pressure of, Raoult and Recoura,

Accumulations of Capital in the United Kingdom in 1875-85, Robert Giffen, 211

Achlya, Prof. Marcus M. Hartog, 298
Acoustics: Melde's Vibrating Strings, Rev. W. Sidgreaves, 355; Propagation of Sound, Violle and Vautier, 359; the Testing of Tuning-forks, Dr. Lehmann, 383
Acquired Characters, Paleontological Evidence for the Trans-

Acquired Characters, Palæontological Evidence for the Transmission of, Henry Fairfield Osborn, 227
Acquired Characters and Congenital Variation: the Duke of Argyll, F.R.S., 173, 294, 366; W. T. Thiselton Dyer, F.R.S., 315; F. V. Dickins, 316; Right Rev. Bishop R. Courtenay, 367; Dr. J. Cowper, 368; Herbert Spencer, 414; Prof. E. Ray Lankester, F.R.S., 415. See also Panmixia Actinometric Observations at Kiev, 1888-89, R. Savelief, 359 Acworth (W. M.): Railways of England, 434; Railways of Scotland, 434
Adams (Prof. J. C., F.R.S.), on certain Approximate Formulæ for Calculating the Traiectories of Shot, 288

for Calculating the Trajectories of Shot, 258
Adamson (Daniel): Death of, 256; Obituary Notice of, 279
Advancement of Science, Australasian Association for the, Prof.

Orme Masson, 441
Africa: H. M. Stanley's Exploration of, 20, 73; Reported
Massacre of Dr. Peters's Party, 21; South African Gold-fields, Massacre of Dr. Peters's Party, 21; South African Gold-fields, the, G. D. Cocorda, 164; the Land of an African Sultan, Walter B. Harris, 270; East Africa and its Big Game, Captain Sir J. Willoughby, 298; African Monkeys in the West Indies, Dr. P. L. Sclater, F.R.S., 368; Meteorology of the Gold and Slave Coast, Dr. Danckelmann, 479
Agriculture: Sheep Farming in Australia, Prof. Wallace, 113; Practical Observations on Agricultural Grasses and other Pasture Plants, William Wilson, 196; Field Experiments on Wheat in Italy, Prof. Giglioli, 404
Ahrens's Polarizing Binocular Microscope, 93
Aitken (John, F.R.S.), On the Number of Dust Particles in the Atmosphere of Certain Places in Great Britain and on the Continent, with remarks on the relation between the Amount of Dust and Meteorological Phenomena, 382, 394
Altkens (Sir William), Animal Alkaloids, Second Edition, 161
Aka Expedition of 1883, Colonel Woodthorpe, 86

Aka Expedition of 1883, Colonel Woodthorpe, 86
Algae, a New Atlas of, Dr. J. Reinke, 127
Algebra: an Elementary Text-book for the Higher Classes of
Secondary Schools and for Colleges, Prof. G. Chrystal, 338
Algebraic Equations, Roots of, Prof. A. Cayley, F.R.S., 335

6

Algeria, Earthquake in, 113
Algoria, Earthquake in, 113
Algol, Satellite of, W. H. S. Monck, 198
Algol, Spectroscopic Observations of, Prof. Vogel, 164, 285
Alpine Chain, a Geological Map of the, Prof. T. G. Bonney, F.R.S., 483

Alpine Expeditions of Dr. Emil Zsigmondy, 291

Aluminium and Nitric Acid, A. Ditte, 599
Amber, Mexican, G. F. Kunz, 372
America: Sir Daniel Wilson on the Recent Toronto Meeting of the American Association for the Advancement of Science, 17; the American As-ociation for the Advancement of Science, 17; European Weeds in, 18; American Journal of Mathematics, 71, 332, 525; American Resorts, with Notes upon their Climate, Dr. Bushrod W. James, 79; American Journal of Science, 46, 92, 309, 405, 500, 598; American Meteorological Journal, 92, 357, 501; American Meteorological Society, 324; American Ethnological Reports, J. W. Powell, 99; American Philosophical Society, Philadelphia, 136; American Naturalist,

Among Cannibals, Carl Lumholtz, 200 Amsterdam, Royal Academy of Sciences, 24, 96, 216, 383, 552,

Analytical Tables, Coloured, H. W. Hake, 29

Anatomy: a Glossary of Anatomical, Physiological, and Biological Terms, T. Dunman, 173; a Text-book of Human Anatomy, Prof. Alex. MacAlister, F.R.S., 269
Anchovies on the South Coast of England, J. T. Cunningham,

Anderson (Joseph), Sugar losing its Attractions for Lepidoptera,

349
André (Ch.), Jupiter's Satellites, 94
Anemometers, W. H. Dines, 212
Angot (Alfred): Wind-Velocity at Top of Eiffel Tower, 48, 67;
the Observations of Temperature on Top of Eiffel Tower,

167; on the Eiffel Tower Observations, 181; Diurnal Range of Barometer, 449
Animal Life, Glimpses of, W. Jones, 409
Animals and Plants, Distribution of, by Ocean Currents, Rev. Paul Camboué, 103

Animals, Effects of Music on, A. E. C. Stearns, 470 Animals, Les Industries des, F. Houssay, 409 Annuario Meteorologico of the Italian Meteorological Society,

Anomalies, Temperature, Dr. R. Spitaler, 303

Anomalies, Temperature, Dr. R. Spitaler, 303
Anoura, the Metamorphosis of, E. Bataillon, 23
Anthropology: the Malay People, Dr. B. Hagen, 21; the Last
Living Aboriginal of Tasmania, 43; Prehistoric Burial-ground
discovered in Caucasus by Beyern, 43; Anthropological
Institute, 119, 256, 406; Journal of the Anthropological Institute, 594; Inheritance of Acquired Mental Peculiarity,
Handtmann, 209; L'Anthropologie, 300; the Veddahs of
Ceylon, Dr. Arthur Thomson, 303; Classification of Races,
Based on Physical Characters only, M. Denniker, 332;
Modern Crania in Montpellier, De Lapouge, 357; the
Cephalic Index of Corsican Population, Dr. A. Fallot, 357;
the Chin Tribes of North Burma, G. B. Sacchiero, 375;
Characteristic Survivals of Celts in Hampshire, T. W. Shore,
406; Charlotte Corday's Skull, Dr. Topinard, 500; Jacques
Bertillon on the Identification of Criminals by Measurement,
592

Anthropometry, Cambridge: Dr. John Venn, F.R.S., 450, 560;

Francis Galton, F.R.S., 454
Antilles, the Lesser, Owen T. Bulkeley, 268
Antiparallel, the Use of the Word, W. J. James, 10; E. M. Langley, 104

Apex of the Sun's Way, Lewis Boss, 548 Aplin (O. V.), the Birds of Oxfordshire, R. Bowdler Sharpe,

169
Aquaria, the Management of, W. P. Seal, 18
Arc Light, Joseph McGrath, 154
Archæology: Interesting Remains discovered in Hamburg, 21;
Archæological Congress at Moscow, 283; Cambridge Archæological Museum, 324; Proposed Archæological Survey of
Ceylon, 372; Vaphio (Morea) Rock-Sepulchre, S. Reinach,
500; Archæology and Ethnology of Easter Island, Walter

Arctic (North Pole) Expedition, Dr. Nansen's Plan for, 374
Arctic Voyagers, Cause of Change of Skin-Colour in, Prof. Holmgren, 546
Area of the Land and Depths of the Oceans in Former Periods,

T. Mellard Reade, 103

Argentina, Dr. Hermann Burmeister on the Fossil Horses and

Argentina, Dr. Hermann Burmeister on the Fossil Horses and other Mammals of, 82
Argentine Ornithology, P. L. Sclater, F.R.S., and W. H. Hudson, R. Bowdler Sharpe, 7
Argyll (the Duke of, F.R.S.): Acquired Characters and Congenital Variation, 173, 294, 366; and the Neo-Darwinians, W. T. Thiselton Dyer, F.R.S., 247
Arloing (M.), Diastases Secreted by Bacillus heminecrobiophilus,

Armenia, the Catastrophe of Kantzorik, F. M. Corpi, 190 Armstrong (Prof. H. E., F. R. S.), Constitution of Tri-derivatives of Naphthalene, 454

of Naphthalene, 454
Arnaud, Digitaline and Tanghinine, 48
Arrest's (D'), Comet, G. Leveau, 596
Ascension, the "Rollers" of, Prof. Cleveland Abbe, 585
Ascidians and Crabs, Prof. W. A. Herdman, 344
Asia, Central: Colonel Roborovski's Expedition in, 234; the Russian Expeditions in, 352
Asia Minor, Prof. Bornmüller's Botanical Tour through, 136

Asiatic Cholera, Bacteria of, Dr. E. Klein, F.R.S., 509
Assaying, Text-book of, C. Beringer and J. J. Beringer, Thomas

Gibb, 245 Assmann (Dr.): Aspiration Thermometers, 239; Climatological

Considerations about Influenza, 325
Association for Improvement of Geometrical Teaching, 207, 282

Association of Public Sanitary Inspectors, 324 Assyrian Sculptured Group, Explanation of, Dr. E. B. Tylor, .R.S., 283

Asteroid, a New, 450

Asteroids, Discovery of, Dr. Palisa, 522; M. Charlois, 522
Astronomy: Our Astronomical Column, 19, 44, 68, 87, 114,
138, 163, 210, 232, 256, 285, 304, 326, 350, 374, 402, 428,
449, 472, 496, 521, 548, 571, 595; Stellar Parallax by means of
Photography, Prof. Pritchard, 19; Measurements of Double
Stars, S. W. Burnham, 19; Barnard's Comet, 1888-89, 19;
Biographical Note on J. C. Houzean, M. A. Lancaster, 20;
Karlsruhe Observatory, 20; Objects for the Spectroscope, A.
Fowler, 20, 44, 68, 87, 114, 138, 163, 183, 210, 232, 256,
304, 326, 350, 374, 402, 428, 449, 472, 496, 521, 548,
571, 595; Large Scale Charts of the Constellations, Arthur
Cottam, 45; Barnard's Comet, II. 1889, March 31, 45; the
Structure of Jupiter's Belt 3, III., Dr. Terby, 45; Hand-book
of Descriptive and Practical Astronomy, G. F. Chambers,
49; Ancient Chinese Astronomical Instruments, 66; the
Minimum Sun-spot Period, M. Bruguière, 68; Return Asteroids, Discovery of, Dr. Palisa, 522; M. Charlois, 522 of Descriptive and Practical Astronomy, G. F. Chambers, 49; Ancient Chinese Astronomical Instruments, 66; the Minimum Sun-spot Period, M. Bruguière, 68; Return of Brorsen's Comet, Dr. E. Lamp, 69; the Companion of η Pegasi, 69; General Bibliography of Astronomy, 69; J. C. Houzeau's Vade Mecum, 69; a New Comet discovered by Lewis Swift, 69; Total Solar Eclipse of 1886, 88; Palermo Observatory, 88; Variable Star V Cygni, 88; Paramatta Observatory, 88; Minor Planet, 282 (Clorinde), 88; Comet Davidson (ε 1889), 88; New Variable Star in Hydra, 88; Rev. S. J. Perry, F.R.S., on Sun-spots in High Southern Latitudes, 88; Origin of Shooting-Stars, 92; M. H. Faye on the Orbit of Winnecke's Periodical Comet, 94; Jupiter's Satellites, Ch. André, 94; Star Distances, Miss A. M. Clerke, 81; Sun-spot of June, July, and August 1889, 115; Photographic Star Spectra, 115; Comet Brooks (d 1889, July 6), Dr. Knopf, 115; Comet Swift (f 1889, November 17), Dr. Zelbr, 115; S Cassiopeiæ, Rev. T. E. Espin, 115; New Double Stars, Miss A. M. Clerke, 132; Brazilian Honours to French Astronomers, 135; Photometric Intensity of Coronal Light, 139; Corona of January 1, 1889, Prof. Tacchini, 139; Minor Planet 12

(Victoria), 139; Comet Swift (f 1889, November 17), Dr. R. (Victoria), 139; Comet Swift (f 1889, November 17), Dr. R. Schorr, 139; Periodic Comets, 139; the Eclipse Parties, 139; Period of U Coronæ, S. C. Chandler, 163; Identity of Breoks's Comet (d' 1889) with Lexell's Comet, S. C. Chandler, 163; some Photographic Star Spectra, 163; Magnitude and Colour of magus, 164; Orbit of Barnard's Comet, 1884 II., 164; Spectrum of Algol, 164; the Newall Telescope for the University of Cambridge, 166; Variable Star in Cluster G.C. 3636, Prof. Pickering, 183; Changes in Lunar Craters, Prof. Thury, 183; the Satellite of Algol, W. H. S. Monck, 198; Recent Observations of Jupiter, W. F. Denning, 206; Dr. Peters's Star Catalogue, 210; Longitude of Mount Hamilton, 211; Comet Borelly (g' 1889, December Denning, 206; Dr. Peters's Star Catalogue, 210; Longitude of Mount Hamilton, 211; Comet Borelly (g 1889, December 12), 211; Comet Brooks (d 1889, July 6), 211; the Solar Eclipse, 211; Identity of Comet Vico (1844) with Brooks's (1889), 233; Observations of some Suspected Variables, Rev. John G. Hagen, 233; Spectrum of a Metallic Prominence, 233; Comet Swift (f 1889, November 17), Dr. Zelbr, Dr. Lamp, 233; Solar Spots and Prominences, Prof. Tacchini, 233; Meteor, Rev. T. W. Morton, 249; the Temperature of the Moon, Prof. Langley, 257; on the Orbit of Struve 228, J. E. Gore, 257; Orbit of Swift's Comet (V. 1880), 257; on the Variability of R. Vulnecular, 257; on the Rotation of E. Gore, 257; Orbit of Swift's Comet (V. 1880), 257; on the Variability of R Vulpeculæ, 257; on the Rotation of Mercury, 257; the Cluster G.C. 1420, and the Nebula N.G.C. 2237, Dr. Lewis Swift, 285; on the Spectrum of & Ursæ Majoris, Prof. Pickering, 285; Spectroscopic Observations of Algol, Prof. Vogel, 286; the Meteorite of Mighei, J. Rutherford Hill, 298; Total Eclipse of January 1, 1889, Prof. Holden, 305; Orbits of the Companions of Brooks's Comet (1889, V., July 6), 305; Greenwich Observatory, 305; Star Land, Sir Robert S. Ball, F.R.S., 315; Eight Rainbows seen at the same time, Sir William Thomson, F.R.S., 316; Dr. Percival Frost, F.R.S., 316; Annuaire du Bureau des Longitudes, 1890, 327; Royal Astronomical Society, 327; Total Solar Eclipse of 1886, Dr. Schuster, F.R.S., 327; Solar Halos and Parhelia, 330; a Photographic Method for Determining Variability in Stars, Isaac Roberts, 332; Earth Solar Halos and Parhelia, 330; a Photographic Method for Determining Variability in Stars, Isaac Roberts, 332; Earth Tremors from Trains, and their Effects on Astronomical Instruments, H. H. Turner, 344; the Nuclei of Great Comet II. of 1882, F. Tisserand, 358; Spectrum of the Zodiacal Light, Maxwell Hall, 351; Solar and Stellar Motions, Prof. J. R. Eastman, 351; Dun Echt Observatory, 351; Transit Observations at Melbourne Observatory, 351; the Maintaining and Working of the Great Newall Telescope, 357; Is the Copernican System of Astronomy True? W. S. Cassedy, 366; Progress of Astronomy in 1886, Prof. Winlock, 374; Maximum Light Intensity of the Solar Spectrum, Dr. Mengarini, 374; Spectrum of Borelly's Comet (g 1889), 374; Spectra of 8 and \(\mu\) Centauri, 374; on the Star System \(\mathbf{E}\) Society of the Heavens, by J. E. Gore, 391; the Distance of the Stars, Dr. W. H. S. Monck, 392; Ephemeris of Brooks's Comet (d 1889), 403; New Short Period Variable in Ophiuchus, 403; Observations of \(\mathef{L}\) Urse Monck, 392; Ephemeris of Brooks's Comet (d 1889), 403; New Short Period Variable in Ophiuchus, 403; Observations of the Magnitude of Iapetus, 403; Observations of & Ursæ Majoris and β Aurigæ, 403; the Movement of Planets, F. Tisserand, 406; Total Solar Eclipse of December 22, 1889, M. A. De La Baume Pluvinel, 428; Comets and Asteroids discovered in 1889, 428; Mass of Saturn, Asaph Hall, 429; the Astronomical Observatory of Harvard College, 446; the Solar and the Lunar Spectrum, Prof. Langley, 450; the Corona of 1889, December 22, W. H. Wesley, 450; Nebular Hypothesis, Herbert Spencer, 450; Nebula, General Catalogue No. 4795, W. E. Jackson, 450; a New Asteroid, 450; Hues's Treatise on the Globes (1592), 459; Astronomy with an Opera Glass, Garrett P. Serviss, 462; Megueia Meteorite, Prof. Simaschko, 472; Velocity of the Propagation of Gravitation, J. Van Hepperger, 472; Vatican Observatory, 472; Double-Star Observations, S. W. Burnham, 472; Sunspot in High Latitudes, G. Dierckx, 472; the Elements of Astronomy, Prof. C. A. Young, 485; Deathand Obituary Notice of, Prof. C. M. V. Montigny, 479; Observatory at Madagascar, 497; the Great Comet of 1882, 522; Melbourne Star Catalogue, 522; Brooks's Comet (a 1890), 522; Discovery of Asteroids, 522; Solar Activity in 1889, 522; New Light from Solar Eclipses, William M. Page, William E. Plummer, 529; the Apex of the Sun's Way, Lewis Boss, 548; Stability of the Rings of Saturn, O. Callandreau, 548; Brooks's Comet (a 1890), 549; Bright Lines in Stellar Spectra, Rev. J. E. Espin, 549; the Moon in London, Rev. T. R. R. Stebbing, 586; the Effect of Railways on Instruments in Observatories, 592;

Bo

Ba Bal Bal

Bal Bal Bal Bal Ball

0 Ban Bar, Barl Bark Raro Bari Barn 18 Barn Baro Barre Baru Iro Bashe Basse and

Mathematical Study of Solar Corona, Prof. F. H. Bigelow, 595; Solar Observations at Rome, Prof. Tacchini, 595; D'Arrest's Comet, G. Leveau, 596; Astronomical Society of France, 596; Observations of Sun-spots made at Lyons Observatory in 1889, by Em. Marchand, 599

Atacama, on the Supposed Enormous Showers of Meteorites in the Desert of, 108
Atlantic, Waterspout in, 470
Atlantic, North, Pilot Chart of, February 1890, 401
Atlantic Ocean, Pilot Chart of the North, 85

Atlas, Facsimile, to the Early History of Cartography, by A. E.

Nordenskiold, 558 Atlas of Algæ, a New, Dr. J. Reinke, 127 Atlas of the World, Library Reference, John Bartholomew, 413 Atmosphere, General Circulation of, Dr. Pernter, 325

Atmospheric Circulation, A. Buchan, 363 Atmospheric Dust, Dr. William Marcet, F.R.S., 358, 473 Atomic Volumes of Elements Present in Iron and their Influence on its Molecular Structure, the Relation between, Prof. W. C.

on its Molecular Structure, the Relation between, Prof. W. C. Roberts-Austen, F. R. S., 420
Attention, Psychology of, Th. Ribot, 460
Auger (V.), a New Class of Diacetones, 215
Australia: Australasian Association for the Advancement of Science, 400; Prof. Orme Masson, 441; Decrease of Kangaroos, 43; Exploration of the Mugrave Ranges, 86; Sheep Farming in, Prof. Wallace, 113; the Useful Plants of, J. H. Maiden, 194; Among Canibals, Carl Lumholtz, 200; Tietkens's Explorations in Central, 286; Australia Twice Tietkens's Explorations in Central, 286; Australia Twice Traversed, Ernest Giles, 341; Report on the Meteorology of Australia, C. L. Wragge, 348; A. J. Campbell's Collections of Bird Skins and Eggs from Western Australia, 593 Austria (H. I. H. the late Prince Rudolph of), Notes on Sport and Ornithology, R. Bowdler Sharpe, 169 Aveling (Rev. F. W.), Light and Heat, 558 Avian Anatomy, Dr. R. W. Shufeldt on, 594 Ayrton (Prof. W. E., F.R.S.), Galvanometers, 310, 381

β-Inosite, Maquenne, 215
Babylonian Metrical System, the, Dr. Lehmann, 167
Bacıllus heminecrobiophilus, Diastases Secreted by, Arloing,

Backhouse (T. W.), Luminous Clouds, 297
Bacteria: of Asiatic Cholera, Dr. E. Klein, F.R.S., 509;
Biology of Anaërobic Bacteria, Dr. Weyl, 359; Luminous and Plastic Food of Phosphorescent Bacteria, Dr. Beyerinck,

g

n

s, 5. ; ns

æ F.

9, ds

9; he

he

lar ta-

0: ith

te, ry,

anof ice

ar,

taof

om

29; the

90), pin, 86;

92;

552; Bacteriological Laboratory, Poona, 469
Bailey (G. H.), Behaviour of more Stable Oxides at High

Balley (G. 11.), Benavious Temperatures, 502
Baker (T. W.), a Meteor, 418
Bala Volcanic Series of Caernarvonshire and Associated Rocks; being the Sedgwick Prize Essay for 1888, Alfred Harker, 414
Ball (John, F.R.S.), Botanical Bequest, 17
Ball (Sir Robert S., F.R.S.): "Time and Tide, a Romance of

Ball (Sir Robert S., F.R.S.), "Time and Tide, a Romance of the Moon," 30; "Star Land," 315
Ball (V., LL.D., F.R.S.), Tavernier's Travels in India, 313
Ballarat School of Mines, Melbourne, 593
Balloon, Asbestos Hot-air, in India, Successful Use of, Percival Spencer, 325

Ballot (Christoforus Henricus Diedericus Buys), Obituary Notice of, 371

ot, 371 Banana Disease in Fiji, Sea-water Cure for, 19 Bar, New Method of Measuring small Elongations of a, Signor Cardani, 427

Cardani, 427
Barbados Monkey, the, Colonel H. W. Feilden, 349
Barber (Thos. Walter), the Engineer's Sketch Book, 52
Barclay (H. G.), Bird-preservation in the Farne Islands, 112
Barillot (Ernest), Manuel de l'Analyse des Vins, 510
Barnard (E. E.): Measurements of Double Stars, 19; Comet
1888-89, 20; Comet II. 1889, March 31, 45; Comet b
1889, Comet c 1889, discovered by, 428
Barnard (James), the Last Living Aboriginal of Tasmania, 43
Barometer, Diurnal Range of, A. Angot, 449
Barrows (W. H.), the Food of Crows, 137
Bartholomew (John), Library Reference Atlas of the World, 413
Barus (Carl), the Molecular Stability of Metals, particularly of

Barus (Carl), the Molecular Stability of Metals, particularly of

Iron and Steel, 369
Bashore (H. B.), [American] Indian Pipe, 303
Basset (A. B., F.R.S.): Extension and Flexure of Cylindrical and Spherical Thin Elastic Shells, 238; on the Effect of Oil on Disturbed Water, 297

Bassot (M.), Difference of Longitude between Paris and Leyden

215 Basutoland, Sir Marshall Clarke on Education in, 86 Bataillon (E.), the Metamorphosis of Anoura, 23 Batoum, Curious Marine Phenomenon at, 426

Bears and Wolves in Bosnia, 325
Bebber (Dr. Van): Loomis on Rainfall of the Earth, 43; Dependence of the Force of Winds upon Surface over which

pendence of the blow, 372
they blow, 372
Beck (C. R.), Crystalline Substances obtained from Fruits of various Species of Citrus, 527
Becker (G. F.), Geology of the Quicksilver Deposits of the

Pacific Slope, 532
Beddard (Frank E.), the Pigment of the Touraco and the Tree Porcupine, 152 Bedford College, London, Physical and Chemical Laboratories

Bedford Cottege, London, Physical and Chemical Laboratories at, 160, 279
Bee, Wax Organs of, G. Carlet, 407
Beetle Settlement in Disused Gasometer, T. H. Hall, 520
Beevor (C. E., M.D.), Arrangement of Excitable Fibres of Internal Capsules of Bonnet Monkey, 166
Before and After Darwin, Prof. G. J. Romanes, F.R.S., 524
Behal. (A.), a New Class of Diacetones, 215
Bellati (Prof. M.), the Absorption of Hudgaren by Iran. 280

Bellati (Prof. M.), the Absorption of Hydrogen by Iron, 380

Bell, Fighting for the, F. C. Constable, 199
Ben Nevis Observatory Report for January 1890, 348
Benda (Dr.), the Coiled Glands in the Skin, 24
Beneden (P. J. Van), Histoire Naturelle des Cétacés des Mers

Benedikt (Dr. R.) and Dr. E. Knecht, Chemistry of the Coal Tar Colours, 8

Bengal, Technical Education in, 66
Benham (W. B.), Earthworms from Pennsylvania, 560
Bennett (Alfred W.): Fossil Rhizocarps, 154; the Revised Terminology in Cryptogamic Botany, 225 Benzoic Acid, New Form of, 594

Benzotc Acid, New Form of, 594
Berget (Alphonse), Relation between Electric and Thermal
Conductivities of Metals, 287
Beringer (C.) and J. J. Beringer, Text-book of Assaying,
Thomas Gibb, 245

Thomas Gibb, 245
Berlin: Physiological Society, 23, 95, 119, 288, 359, 407, 479, 504, 528, 599; Berlin Academy of Sciences, Money Grants, 42; Research Grants, 426; Physical Society, 95, 167, 215, 239, 263, 383, 407, 480, 504, 551; the Proposed Berlin International Horticultural Exhibition, 283; Berlin Nachtigall Gesellschaft, 426; Meteorological Society of, 95, 215, 383, 479, 504; Berlin Natural Science Museum, Opening of, 112 "Bermuda Islands," the, Angelo Heilprin, Dr. H. B. Guppy, 102

Bermuda Islands, Proposed Meteorological Station at the, 85 Bernoulli on the St. Petersburg Problem, 165 Bernthsen (A.), a Text-book of Organic Chemistry, 172 Berry (David), Bequest of £100,000 to the University of St.

Andrews by, 41
Berthelot (M.): Animal Heat, 119; the Carbon Graphites,

Berthelor (M.): Animar freat, 119; the Carbon Graphics, 311; Formation of Nitrates in Plants, 311; Berthelot and P. Petit on Animal Heat and the Combustion of Urea, 94
Bertillon (Jacques): Application of Photography to Study of Physical Peculiarities engendered by different Occupations, 230; on the Identification of Criminals by Measurement, 592

Bertrand's Refractometer, Prof. S. P. Thompson, 526
Bertrand's Idiocyclophanous Prism, Prof. S. P. Thompson, 574
Berwickshire, the Birds of, Geo. Muirhead, R. Bowdler Sharpe,

Besson (M.): Combination of Ammonia and Phosphoretted Hydrogen with Dichloride and Dibromide of Silicon, 339; Combination of Gaseous Phosphoretted Hydrogen with

Boron and Silicium Fluorides, 287
Bethnal Green Free Library, Proposed Enlargement of, 349
Betts (Benjamin), a New Logical Machine, 79

Bevan (E. J.): Acetylation of Cellulose, 142; the Constituents of Flax, 143
Beyerinck (Dr.), Luminous and Plastic Food of Phosphorescent

Bacteria, 552
Beyern, Prehistoric Burial Ground in Caucasus discovered by,

Beynon (Richard), Effect of Oil on Disturbed Water, 205 Bezold (Prof. von), on the Production of Clouds, 95 Bible, the Religion of the Semites, Prof. W. Robertson Smith,

337

В

B B B

B Bi B

B

Bi

Bu

Bu Bu

Bu

Bu

Bu Bu

Bibliography of Astronomy, General, 69 Bibliothèque Photographique, P. Moëssard, 224 Biddulph, Lieut. General Sir Robert, Cyprus, 45 Bidschof (Dr.), Comet Brooks (a 1890), 571 Bidwell (Shelford, F.R.S.), Electrification of Steam, 213 Big Game, East Africa and its, Captain Sir John C. Willoughby,

Bigelow (Prof. F. H.), Mathematical Study of Solar Corona,

Frof.
 Biology: Proposed Lacustrine Station on Lake Plön, 18; Prof.
 Weismann's Essays, Dr. St. George Mivart, F.R.S., 38;
 Marine Biology, the Puffin Island Station, 304; Biology of Anaërobic Bacteria, Dr. Weyl, 359; the Botanical Institute

and Marine Station at Kiel, 397
Bionomics, "Like to Like," a Fundamental Principle in, Prof.
Geo. J. Romanes, F.R.S., 535; John T. Gulick, 535
Bird-preservation in the Farne Islands, H. G. Barelay, 112
Birds of Berwickshire, Geo. Muirhead, R. Bowdler Sharpe,

169 Birds: Count Salvadori on the Birds of New Guinea and the

Birds: Count Salvadori on the Birds of New Guinea and the Molucca Islands, 85
Birds, Dr. R. W. Shufeldt on Avian Anatomy, 594
Birds of India, Vol. I., E. W. Oates, 388
Birds in My Garden, W. T. Greene, R. Bowdler Sharpe, 169
Birds of Oxfordshire, O. V. Aplin, R. Bowdler Sharpe, 169
Birds, Sea, the Wanton Destruction of, G. W. Lamplugh, 490
Black Sea: Proposed Scientific Investigation of, 348; the Level

of the, 356

of the, 350
Bladder in Fishes, the, Prof. Liebreich, 359
Blanchard (Prof. Raphael): Discovery of Carotine Pigment in
Alpine Lake Crustacean, 325; a Colouring-matter from
Diaptomus analogous to Carotin, 383

Blanford (Dr., F.R.S.), Presidential Address to the Geological

Society, 455
Blind Species, Cave Fauna of North America, with Remarks on the Anatomy of the Brain and Origin of the, A. S.

on the Anatomy of the Packard, 507
Packard, 507
Blumentritt (Dr. F.), Ethnology of Philippine Islands, 327
Blunfield (R. W.), Alexandrian Garden Pest, 181
Boat, Submarine, Periscope for Navigating, 349
Bodmer (G. R.), Hydraulic Motors, Turbines and Pressure

Engines, 27
Bogdanovitch (M.), in Central Asia, 352
Boguski (J. J.), Variations of Electric Resistance of Nitric Peroxide at various Temperatures, 119
Boilers, Marine and Land, T. W. Traill, 486
Boilers, the Evaporative Efficiency of, C. E. Stromeyer, 516

Boisbaudran (Lecoq de), some New Fluorescent Materials, 287 Boilettino of Italian Geographical Society, 164 Bonavia (Dr. E.), the Cultivated Oranges and Lemons of India and Ceylon, C. B. Clarke, F. R. S., 579 Bone and Dentine, the Longevity of Textural Elements, par-ticularly in Long Clalend, con-

ticularly in, John Cleland, 392

Bonn, Earthquake at, 470
Bonney (Prof. T. G., F.R.S.): Crystalline Schists and their
Relations to Mesozoic Rocks in Lepontine Alps, 333; a Geological Map of the Alpine Chain, 483

Bonsdorf (A. B.), the Secular Upheaval of the Coasts of Fin-

land, 348
Boole (Mary), a New Logical Machine, 79
Borelly's Comet (g 1889, December 12), 211, 374, 429
Borneo (British North), Gold Exploration in, 182

Born (Teisserenc de), Barometric Gradients, 161
Bosnia: Earthquakes in, 136; Bears and Wolves in, 325
Boss (Lewis), Apex of the Sun's Way, 548
Botany: On a New Application of Photography to the Demonstration of Physiological Processes in Plants, Walter Gardiner, 16; Foreign Botanical Appointments, 17, 136; Russian Botanical Appointments, 42; John Ball Bequest, 17; European Weeds in America, 18; Sea-water Cure for 17; European Weeds in America, 18; Sea-water Cure for the Banana Disease, 19; some Provençal Tree Hybrids, G. de Saporta, 23; Retarded Germination, 31; the African Oil Palm in Labuan, 42; Street Plants in Manchester, 42; Enumeratio Specierum Varietatumque Generis Dianthus, F. N. Williams, 51; Morphology and Biology of Oidium albicans, Linossier and Roux, 72; the Flora of Derbyshire, by the Rev. W. H. Painter, 77; Pinks of Western Europe, by F. N. Williams, 78; Curious Dwarf Japanese Tree, Thuja obtusa, 86; Herr Kny, on Trees Growing in an Inverted Position. 86; Herr Kny, on Trees Growing in an Inverted Position, 86; How Plants maintain themselves in the Struggle for Existence, Prof. Walter Gardiner, 90; the Botanical Gazette,

92; Journal of Botany, 92; Nuova Giornale Botanico Italiano, 92; Cool Cultivation of Tropical, &c., Plants, Thiselton Dyer, 92; Cool Cultivation of Tropical, &c., Plants, Insenton Dyer, 136; Botanical Tour through Asia Minor, Prof. Bornmüller's, 136; Tubercles on Roots of Leguminous Plants, Prof. H. Marshall Ward, F.R.S., 140; the Flora of Suffolk, by Dr. W. M. Hind, 149; Noxious Grass, Lalang, at Singapore, 182; the Useful Plants of Australia, J. H. Maiden, 194; Index of British Plants, Robert Turnbull, 196; Hand-book of 182; the Useful Plants of Australia, J. H. Maiden, 194; Index of British Plants, Robert Turnbull, 196; Hand-book of Practical Botany for the Botanical Laboratory and Private Student, E. Strasburger, 223; the Revised Terminology in Cryptogamic Botany, Alfred W. Bennett, 225; Flower-Land, an Introduction to Botany, Robert Fisher, 247; the Coco de Mer, 256; Malayan Plants in Calcutta Herbarium, 283; the Weather Plant (Abrus precatorius), Dr. Francis Oliver, 283; St. Louis, the Shaw Bequest for the Endowment of Botanic Garden at, 324; the Kew Bulletin, 325, 426; Sweet-scented Fern, 349; Das australische Florenelement in Europa, Dr. Constantin Freiherr von Ettingshausen, 365; Effects of Fog on Plants under Glass, 372; Melilotus alba (Bokhara Clover) as a Weed in Western States of America, 372; Germination of Castor-oil Plant Seed, J. R. Green, 380; Die Arten der Gattung Ephedra, von Dr. Otto Stapf, 390; the Botanical Institute and Marine Station at Kiel, 397; Hygrometric Club Moss from Mexico, 401; Botanical Gazette, 405; Diseases of Plants, Prof. H. Marshall Ward, F.R.S., 436; the Botanical Laboratory in the Royal Gardens, Peradeniya, Ceylon, 445; Haudleiding tot de Kennis der Flora van Nederlandsch Indie, 461; Abnormal Shoots of Ivy, W. F. R. Weldon, 464; Seeding of Sugar-Cane, D. Morris, 478; True Nature of Callus, Spencer Moore, 478; the Dispersal of Plants, as Illustrated by the Flora of the Keeling Islands, Dr. H. B. Guppy, 492; Salad-plants, H. de Vilmorin, 494; the Native Ebony of St. Helena, Morris, 519; Self-colonization of Coco-nut Palm, W. B. Hemsley, 537; Suggestion for Facilitating the Study of Botany in India, G. Carstensen, 546; Self-colonization of Coco-nut Palm, Captain W. J. L. Wharton, F.R.S., 585; Organization of Fossil Plants of Coal-measures, Prof. Williamson, F.R.S., 572; Botanical Condition of German Ocean, Major Reinhold, 569; a Blue Primrose, 569; Threatened Ex-Solution of Fossi Figure 3 Condition of German Ocean, Major Reinhold, 569; a Blue Primrose, 569; Threatened Extinction of Cyclamen in Savoy, 569; How to know Grasses by their Leaves, A. N. M'Alpine, Prof. John Wrightson, 557 Bottomley (J. T., F.R.S.), Four-Figure Mathematical Tables, 510

Bouchard (Ch.), Mechanism of the Local Lesion in Infectious

Diseases, 48
Bourdon's Pressure-Gauge: Prof. A. M. Worthington, 296;
Prof. A. G. Greenhill, F.R.S., 517
Bournemouth Industrial and Loan Exhibition, Science Exhibits

Boussingault (M.), Proposed Statue to the late, 207, 348
Boutzoureano (M.), on a New Series of Salts of Selenite, 87
Bower (J. A.), Science of Every-day Life, 78
Boys (C. V., F.R.S.), on the Cavendish Experiment, 155
Brande (Dr.), Taxine, a New Alkaloid from Yew Leaves, &c.,

Brandis (Sir D., F.R.S.), a Manual of Forestry, William Schlich, 121

Schich, 121
Brassart Brothers' New Seismoscopes, 137
Brazil, Dr. Lund's Exploration of the Limestone Caverns of, 26
Brazilian Honours to French Astronomers, 135
Bréal (M.), Fixation of Nitrogen of the Leguminosæ, 23
Breathing, Thought and: R. Barrett Pope, 297; Prof. F. Max
Müller, 317; Rev. W. Clement Ley, 317; Mrs. J. C. Murray-

Aynsley, 441
Brewery and Malt-House, the Microscope in the, Chas. Geo.

Mathews and Francis Edw. Lott, 246
Brezina (A.), Die Meteoritensammiung des k.k. mineralog. Hofkabinetes in Wien, 127

Brezina (A.) and E. Cohen, Die Structur und Zusammensetzung der Meteoreisen erläutert durch photographische Abbildungen

ing Chemistry, 160

der Meteoreisen erlautert durch pnotographische Abbildungen geätzter Schnittfächen, 127 Brick Buildings, Magnetism in, R. W. Wilson, 405 Bridge across the Bosphorus, Proposed, 568 Bridge, Chenab, Testing of, 372 Bridge, Testing of the New Forth, 281; Opening of the, 429 Bright Lines in Stellar Spectra, Rev. J. E. Espin, 549 Brinton (Dr. D. G.): Ethnologic Affinity of Ancient Etruscans, 66; Etruscans a Libyan Offshoot, 448; the Cradle of the

Semites, 569 British Association, Second Report of the Committee on Teachn

d

n

r

b of al

i,

s,

of

as

**;** 

ts

m

26

y-

0.

g.

h-

British Earthquakes, Record of, Charles Davison, 9; William

White, 202
British Guiana, the Journal Timehri, 549
British Journal Photographic Almanac, 1890, 510
British Journal Photographic Almanac, 1890, 510
British Museum: Reading Room, 199; Electric Light at the, 301; Catalogue of the Fossil Reptilia and Amphibia in the, Richard Lydekker, 534
British Plants, Index of, Robert Turnbull, 196
Brodhun (Dr.), New Contrast-Photometer, 552
Brock and its Banke, the Reu, L.G. Wood 52

Brook and its Banks, the, Rev. J. G. Wood, 53
Brooks (W.): Comet a 1889, Comet d 1889, discovered by, 428;
Comet (d 1889, July 6) Dr. Knopf, 115, 211; Brooks's Comet (1889), Identity of Comet Vico (1844) with, 233; Orbits of the Companions of, 305; Brooks's Comet (a 1890), 522, 549;
Dr. Bidephof 573. Dr. Bidschof, 571
Brorsen's Comet, Return of, Dr. E. Lamp, 69
Brown (Arthur), Mirages, 225
Brown (A. B.), the Steering of Steam-ships, 516
Brown (Prof. Crum), a New Synthesis of Dibasic Organic Acids,

43I

Brown (H. T., F.R.S.), Identity of Cerebrose and Galactose, 262 Browne (Montagu), the Vertebrate Animals of Leicestershire and Rutland, 220

Bruce (E. S.), an Optical Feature of Lightning Flashes, 406 Bruguière (M.), Minimum Sun-spot Period, 68 Brush-Turkeys on the Smaller Islands north of Celebes, Dr.

A. B. Meyer, 514
Bryan (G. H.), Stability of Rotating Spheroid of Perfect Liquid, 526

Bryce's (Prof. J.) Speech on Presentation of A. R. Wallace for Degree of D.C.L. at Oxford, 112

Buchan (A.), Atmospheric Circulation, 363 Buchan (Dr.), Influenza and Weather, 596 Buffalo in Northern Australia, Increase of, 18

Bulk of Ocean Water, Is the, a Fixed Quantity, A. J. Jukes-

Browne, 130
Bulk of Ocean Water, Does the, Increase, T. Mellard Reade, 175; Rev. Osmond Fisher, 197 Bulkeley (Owen T.), the Lesser Antilles, 268

Bulletin de l'Académie Royal de Belgique, 212, 237 Bulletin de la Société d'Anthropologie, 332 Bulletin de la Société Imperiale des Naturalistes de Moscou, 92 Bummelen (Van), Composition of Tobacco-growing Soils in

Deli and Java, 384
Burder (Geo, F.), Self-luminous Clouds, 198
Burmah, a Thousand Miles on an Elephant in the Shan States,
Holt S. Hallett, 265

Burmeister (Dr. Hermann), on the Fossil Horses and other Mammals of Argentina, 82 Burnham (S. W.): Measurements of Double Stars, 19; Double-

Burnham (S. W.): Measurements of Double Stars, 19; Doub Star Observations, 472 Burton (C. V.), a Physical Basis for the Theory of Errors, 47 Burton (F. M.), Chiff-Chaff Singing in September, 298 Burton (Prof. W. K.), Electrical Cloud Phenomena, 10 Buschan (Herr), Prehistoric Textiles, 182 Butter, Cocoa-Nut, 162, 284 Butterflies, Maltese, George Fraser, 199 Buys-Ballot (Prof. C. H. D.), Death of, 324

Caballero (Dr. E.), Remarkable Meteor at Pontevedra, 303 Cælum, New Variable in, Prof. Pickering, 571 Caernarvonshire, Volcanic Rocks of, Alfred Harker, 414

Calculus of Probabilities, J. Bertrand, 6
California, Spread of the Australian Ladybird in, J. R. Dobbins,

Callandreau (O.), Stability of the Rings of Saturn, 548
Calorimeter, the Steam, J. Joly, 212
Camboué (Rev. Paul), Distribution of Animals and Plants by Ocean Currents, 103

Cambrian and Silurian, Sedgwick and Murchison, Prof. James

D. Dana, 421
ambridge: University of, Appointment of Examiners the Mechanical Workshops at, 23; the John Lucas Walker Fund, 23; Election of Fellows at St. John's College, 23; Science and the Indian Civil Service, 25; Physiology at, 41; the Newall Telescope, 166; Archæological Museum, 324; University Natural Science Club Conversazione, 371; Anthropometry at, 560; Dr. John Venn, F.R.S., 450; Francis Galton, F.R.S., 454

Campbell (A. J.), Collections of Western Australian Birdskins

and Eggs, 593 Canada, Mining and Mineral Statistics of, 87 Canary, Effects of Musical Sounds on a, 593

Cannibals, Among, Carl Lumholtz, 200 Capacity, Specific Inductive, Prof. Oliver J. Lodge, F.R.S., 30 Capital, Accumulations of, in the United Kingdom in 1875–85, Robert Giffen, 211

Capital, the Growth of, Robert Giffen, 553
Carbutt (Mrs. E. H.), Five Months' Fine Weather in Canada,
Western United States, and Mexico, 247
Cardani (Signor), New Method of measuring Small Elongations

of a Bar, 427 Carinthia, Earthquake in, 284

Carlet (G.), Wax Organs of Bees, 407 Carlet (E. W.), Note on a Probable Nervous Affection observed

in an Insect, 197
Carnelley (Prof.): the Relation of Physiological Action to Atomic Weight, 189; Attempt to express Periodic Law of Chemical Elements by Algebraic Formula, 304
Carotine Pigment in Alpine Lake Crustacean, Discovery of, by

Prof. Raphael Blanchard, 325, 383
Carruthers (G. T.), Locusts in the Red Sea, 153
Carstensen (G.), Suggestion for Facilitating Study of Botany in India, 546

Cartailhac (Emile), La France Préhistorique, 102 Carter (Brudenell), Vision-Testing for Practical Purposes, 302 Cartography, Facsimile Atlas to the Early History of, A. E. Nordenskiöld, 558

Carus-Wilson (Charles A.): Behaviour of Steel under Mechanical Stress, 213; the Rupture of Steel by Longitudinal Stress,

Cashmere, North-West, Dauvergne's Journey in, 165 Cassedy (W. S.), Is the Copernican System of Astronomy True?,

Cassiopeiæ, S, Rev. T. E. Espin, 115 Catalogue of the Fossil Reptilia and Amphibia in the British Museum (Natural History), Richard Lydekker, 534 Cattle-poisoning by Ergotized Lolium, 569

Caucasus, Prehistoric Burial Ground in, Beyern, 43 Caucasus, Search and Travel in the, D. W. Freshfield, 351

Caucasus, a Trip through the Eastern, Hon. John Abercromby,

Causes of Variation, E. D. Cope on, Prof. E. Ray Lankester, F.R.S., 128 Cave Dwelling in New Zealand, Discovery of, H. O. Forbes

209 Cave Fauna of North America, with Remarks on the Anatomy

of the Brain and Origin of the Blind Species, A. S. Packard,

Cavendish Experiment, C. V. Boys, F.R.S., on the, 155 Cayley (Prof. A., F.R.S.), Roots of an Algebraic Equation,

335, 359
Celebes Photographs, Dr. A. B. Meyer, 471; Brush-Turkeys on the Smaller Islands north of, Dr. A. B. Meyer, 514
Celts in Hampshire, Characteristic Survivals of, T. W. Shore,

Centauri, Spectra of 8 and  $\mu$ , 374 Cetacea, *Rorqual musculus* stranded in Médoc District, 113 Cétacés des Mers d'Europe, Histoire Naturelle des, P. J. Van Beneden, 223

Ceylon: Geodetical Survey of, 86; the Veddahs of, Dr. Arthur Thomson, 303; Asiatic Society, 349; Proposed Archæological Survey of, 372 Chabrie (M.): the Chlorides of Selenium, 284; Gas obtained

by Heating Silver Fluoride with Chloroform in Sealed Tube,

Chaffinch, the, E. J. Lowe, F.R.S., 394
Challenger Expedition: Report on the Magnetical Results of the
Voyage of H.M.S., E. W. Creak, F.R.S., 105; Zoological
Results of the, 217; Report on the Scientific Results of the
Exploring Voyage of H.M.S., 361; Meteorological Report

of the, 443 Chambers (G. F.), Hand-book of Descriptive and Practical

Astronomy, 49 Chandler (S. C.): Period of U Coronæ, 163; Identity of Chandler (S. C.): Period of Colonic, 103; Attenty of Brooks's Comet (d 1889) with Lexell's Comet (1770), 163 Characters, Acquired: and Congenital Variation, the Duke of Argyll, F.R.S., 173, 294; Palæontological Evidence for the Transmission of, Henry Fairfield Osborn, 227; Congenital Variation, the Duke of Argyll, F.R.S., 366; Right Rev. Bishop R. Courtenay, 367; Dr. J. Cowper, 368; Inheritance of, Herbert Spencer, 414; Prof. E. Ray Lankester, F.R.S., 415; Transmission of, Prof. E. Ray Lankester, F.R.S., 486 Charlois (M.), Discovery of Asteroids, 522 Charts of the Constellations, Large Scale, Arthur Cottam, 45 Chatelier (H. Le), Electrical Resistance of Iron Alloys at High

Temperatures, 383 Chelmsford, Earthquake at, 256

Chelmsford, Supposed Earthquake at, on January 7, Chas.

Davison, 369 Chemistry: Chemistry of the Coal-tar Colours, Dr. R. Benedikt hemistry: Chemistry of the Coal-tar Colours, Dr. R. Benedikt and Dr. E. Kuecht, 8; Experiments upon Simultaneous Production of Pure Crystals of Sodium Carbonate and Chlorine Gas from Common Salt, Dr. Hempel, 19; the Microscope as Applied to Physiological Chemistry, Prof. Kossel, 23; Sorbite, Vincent and Delachanal on, 23; Double Nitrites of Ruthenium and Potassium, Joly and Vèzes, 23; Agricultural Chemistry, Fixation of Nitrogen by the Leguminosæ, M. Bréal, 23; Air in the Soil, Th. Schlessing, fils, 23; the Exhaustion of Soils Cultivated without Manure, and the Value of Organic Matter, in Soil P. P. Debrigin, Ita, the Ferof Organic Matter in Soil, P. P. Dehérain, 119; the Fermentation of Stable Manure, Th. Schlæsing, 143; Composition of Tobacco-growing Soils in Deli and Java, Van Bummelen, 384; Absorption of Atmospheric Ammonia by tion of Tobacco-growing Soils in Dell and Java, Van Bummelen, 384: Absorption of Atmospheric Ammonia by Soils, H. Schlæsing, 479; Redetermination of Atomic Weight of Palladium, Dr. E. H. Keiser, 44; Nitrosochloride of Pinol, a new Isomer of Camphor, 44; Researches on Digitaline and Tanghinine, Arnaud, 48; Phenyl-thiophene, A. Renard, 48; the Composition of the Chemical Elements, A. M. Stapley, 56; New Mode of Preparing Manganese, Dr. Glatzel, 67; Laboratory at Stalybridge Mechanics' Institute, 85; a Case of Chemical Equilibrium, W. H. Pendlebury, 104; a New Method of Preparing Fluorine, M. Moissan, 117; Perfected Mode of Preparing Fluorine, H. Moissan, 119; Introduction to Chemical Science, R. P. Williams and B. P. Lascelles, 128; Chemical Society, 142, 191, 262, 335, 468, 562, 519; Isolation of Tetrahydrate of Sulphuric Acid existing in Solution, S. U. Pickering, 142; Magnetic Rotation of Nitric Acid, &c., Dr. W. H. Perkin, F.R.S., 142; Phosphorus Oxyfluoride, Method of making, Thorpe and Hambly, 142; Acetylation of Cellulose, Cross and Bevan, 142; Action of Light on Moist Oxygen, Dr. A. Richardson, 142; a-\theta-Dibenzoylstyrolene and Zinin's Lepiden Derivatives, Japp and Klingemann, 142; Oxyamidosulphonates and their Conversion into Hyponitrites, Divers and Haga, 143; Constituents of Flax, Cross and Bevan, 143; a Text-book of Organic Chemistry, A. Bernthsen, 172; Synoptical Tables of Organic and Inorganic Chemistry, Clement J. Leaper, 510; Compounds of Phenanthracuinone with Metallic Salts. Japp and Turner. Inorganic Chemistry, Clement J. Leaper, 510; Compounds of Phenanthraquinone with Metallic Salts, Japp and Turner, 191; B-Inosite, Maquenne, 215; a New Class of Diacetones, Behal and Auger, 215; Examination of Mighei (June 9, 1889) Meteorite, Stanislas Meunier, 232; Frangulin, Thorpe and Robinson, 262; Arabinon, C. O. Sullivan, F.R. S., 262; the Identity of Cerebrose and Galactose, Brown and Morris, 262; Action of Chloroform and Alcoholic Potash on Hydrazines, Dr. S. Ruhemann, 263; Refracting Powers of Simple Salts in Solution, E. Doumer, 263; the Chlorides of Selenium, Chabrié, 284; Combinations of Gaseous Phosphoretted Hydro-Chabrie, 284; Combinations of Gaseous Phosphoretted Hydrogen with Boron and Silicium Fluorides, Besson, 287; the Story of Chemistry, Harold Picton, F.R.S., 292; the Chemistry of Photography, R. Meldola, F.R.S., 293; Attempt to express Periodic Law of Elements by Algebraic Formula, Prof. Carnelley, 304; the Physical and Chemical Characteristics of Meteorites as throwing Light upon their Past History I. Norman Lockyer, F.R.S., 205; the Carbon Characteristics of Meteorites as throwing Light upon their Past History, J. Norman Lockyer, F.R.S., 305; the Carbon Graphites, Berthelot and Petit, 311; Formation of Nitrates in Plants, Berchelot, 311; Refracting Power of Double Salts in Solution, E. Doumer, 312; New Method of Synthesizing Indigo, Dr. Flimm, 326; New Method of Estimating Oxygen Dissolved in Water, Dr. Thresh, 335; Phosphorus Trifluoride, M. Moissan, 349; Combinations of Ammonia and Phosphuretted Hydrogen with Dichloride and Dibromide of Silicon, Besson, 350; Report on the Scientific bromide of Silicon, Besson, 359; Report on the Scientific Results of the Exploring Voyage of H.M.S. Challenger, 361; Two Gaseous Fluorides of Carbon, Moissan, 373; the Absorption of Hydrogen by Iron, Bellati and Lussana, 380; New Estimates of Molecular Distance, Dr. Peddie, 382; a Dictionary of Applied Chemistry by Prof. T. E. Thorpe, F.R.S., Vol. I., Sir H. E. Roscoe, M.P., F.R.S., 387; New Compounds of Hydroxylamine with Metallic

Chlorides, Crisner, 401; Diethyline Diamine, Dr. J. Sieber, 428; Analysis of Carcote (Chili) Meteorite, Drs. Will and Pinnow, 428; Prof. Crum Brown on a New Synthesis of Dibasic Organic Acids, 431; the Vapour-pressure of Acetic Acid Solutions, Raoult and Recoura, 431; Volumetric Estimation of Copper, Etard and Lebeau, 431; Crystalline Allotropic Forms of Sulphur, Dr. Muthmann, 449; Nitrous Anhydride and Nitric Peroxide, Prof. Ramsay, F.R.S., 454; Constitution of Tri-derivatives of Naphthalene, Armstrong and Wynne, 454; Estimation of Free Halogens and Iodides in presence of Chlorine and Bromine, P. Lebeau, 479; a New Alkaloid (Taxine) from Leaves, &c., of Yew Tree, Drs. Hilger and Brande, 496; Behaviour of more Stable Oxides at High Temperatures, Dr. G. H. Bailey and W. B. Hopkins, 502; Influence of Different Oxides on Decomposition of Potassium Chlorate, Fowler and Grant, 502; Ammonium Hypochlorite, Chlorate, Fowler and Grant, 502; Ammonium Hypochlorite, Cross and Bevan, 502; the Production of Ozone by Flames, J. T. Cundall, 502; Action of Sulphuric Acid on Aluminium, A. Ditte, 503; the α Dextro- and Lævo-rotatory Borneol Camphorates, A. Haller, 503; Isolation of Fluoroform, M. Camphorates, A. Haller, 503; Isolation of Fluoroform, M. Meslans, 521; Gas obtained by heating Silver Fluoride with Chloroform in Sealed Tube, M. Chabrié, 521; the Glow of Phosphorus, Prof. T. E. Thorpe, F.R. S., 523; Apparatus for Distilling Mercury in Vacuum, Prof. Dunstan, 526; Thecry of Osmotic Pressure, Prof. S. U. Pickering, 526; Crystalline Substances obtained from Fruits of various Species of Citrus, Prof. W. A. Tilden, F.R. S., and C. R. Beck, 527; Studies on Isomeric Change, IV.; Halogen Derivatives of Quinone, A. R. Ling, 527; Hydrazine, Drs. Curtius and Jay, 547; Crystals of Lime, H. A. Miers, 560; a Nitrosoplatinichloride, M. Vèzes, 576; Glycollic Nitrile and Direct Synthesis of Glycollic Acid, Louis Henry, 576; Nessler's Ammonia Test as a Micro-Chemical Reagent for Tannin, Spencer Moore, 585; New Form of Benzoic Acid, 594 Chenab Bridge, Testing of, 372 Chiff-Chaff Singing in September, F. M. Burton, 298; Rev.

W. Clement Ley, 317 Chin Tribes, North Burma, the, G. B. Sacchiero, 375

China, Flora of, 46 China, Increasing Coldness of Climate in, 570

China, Scientific Education in, the Question of Language, 162

Chinese Astronomical Instruments, Ancient, 66 Chloroform, the Hyderabad Commission, 154, 289 Cholera, Bacteria of Asiatic, Dr. E. Klein, F.R.S., 509

Cholera Epidemics, the Suspected Connection between Influenza

and, Dr. Smolenski, 282 Chree (C.), Effects of Pressure on Magnetization of Cobalt, 237 Chrystal (Prof. G.), Algebra, an Elementary Text-book for the Higher Classes of Secondary Schools and for Colleges, II.,

Cicadida, Oriental, W. L. Distant's Monograph on, 161

Cingalese Manuscripts, Ancient, 349 City and Guilds of London Institute, 160

City of Paris, the Accident to the Engines of, 592 Civil Service Examinations, the Future Indian, 265 Civilization, Early Egyptian, W. M. Flinders-Petrie, 109 Clarke (Sir Marshall) on Education in Basutoland, 86

Cleland (John), the Longevity of Textural Elements, particularly

in Dentine and Bone, 392 Clerke (Miss A. M.): Star Distances, 81; New Double Stars,

Climate, Dr. Bushrod W. James on American Resorts, with Notes on their, 79 Climate in China, Increasing Coldness of, 570

Clorinde, New Minor Planet, 88 Cloud Phenomena, Electrical, Prof. W. K. Burton, 10

Clouds: Prof. von Bezold on the Production of, 95; Luminous Night, Evan McLennan, 131; Self-luminous Clouds, Geo. F. Burder, 198; C. E. Stromeyer, 225; T. W. Backhouse, 297; Joseph John Murphy, 298; Robert B. White, 369; Photographs of Luminous, O. Jesse, 592
Clover, Bokhara, as a Weed in Western States of America,

372
Clupea harengus, some Stages in Development of Brain of, E.

W. L. Holt, 525 Cluster G.C. 3636, Variable Star in, Prof. Pickering, 183 Cluster G.C. 1420 and the Nebula N.G.C. 2237, Dr. Lewis

Swift, 285 Coal-tar Colours, Chemistry of the, Dr. R. Benedikt and Dr. E. Knecht, 8

Coal: Discovery of, in Kent, 400; Prof. W. Boyd Dawkins,

F.R.S., 418; Spontaneous Combustion of, in Ships, Prof. V. Lewes, 517; Organization of Fossil Plants of Coal measures, Prof. W. C. Williamson, F.R.S., 572 Coasts of Finland, the Secular Upheaval of, 348

Cobalt, Effects of Pressure on Magnetization of, C. Chree, 237

Cockburn (J.), a Brilliant Meteor, 81
Cockerell (T. D. A.): Galls, 344, 559; a Greenish Meteor, 369; some Notes on Dr. A. R. Wallace's "Darwinism," 393

309; some Notes on Dr. A. K. Wallace's Dalwinson, 1993 Coco de Mer, the, 256
Coco-nut Palm, Self-fertilization of, W. B. Hemsley, F.R.S., 537; Captain W. J. L. Wharton, F.R.S., 585
Cocoa-nut Butter, 162, 284
Cocorda (G. D.), the South African Gold-fields, 164
Code, Technical Education in the New Education, 505
Coldstream (William), Illustrations of some of the Grasses of

the Southern Punjab, being Photo-lithographs of some of the Principal Grasses found at Hissar, 533 Coleman (A. P.), Glories, 154 Collins (F. Howard): an Epitome of the Synthetic Philosophy,

340; Heredity and the Effects of Use and Disuse, 559 Colomb (Admiral), Rule of the Road at Sea, 515 Coloration, Protective, of Eggs, Dr. Alfred R. Wallace, 53; Rev. Fred F. Grensted, 53; E. B. Titchener, 129

Colour-blind Engine Drivers, 325 Colour-blindness in the Mercantile Marine, 494

Colour-blindness, the Committee on, 568
Coloured Analytical Tables, H. W. Hake, 29
Colouring-matter, a New Green Vegetable, C. Michie Smith,

573 Colours, Chemistry of the Coal-tar, Dr. R. Benedikt and Dr.

E. Knecht, 8
Combustion, Spontaneous, in Coal Ships, Prof. V. Lewes, 517
Comets: Barnard's Comet, 1888-89, 20; Barnard's Comet, II.
1889, March 31, 45; Comet Borelly (g 1889, December 12),
211; Spectrum of, 374; Brooks's (d 1889, July 6), Dr.
Knopf, 115, 211; Identity of Brooks's Comet (d 1889) with
Lexell's (1770), S. C. Chandler, 163; Orbit of Barnard's
Comet (1884, II.), 164; a New Comet, 164; Identity of
Comet Vico (1844) with Brooks's (1889), 233; Ephemeris
of Brooks's Comet (d 1889), 403; Orbits of the Companions
of, 305; Comets and Asteroids discovered in 1889—Comet a
1889, W. Brooks, 428; Comet b 1889, E. E. Barnard, 428;
Comet c 1889, E. E. Barnard, 428; Comet d 1889, W.
Brooks, 428; Comet g 1889, Davidson, 429; Comet f 1889,
Lewis Swift, 429; Comet g 1889, M. Borelly, 429; Brooks's
Comet (a 1890) 522, 549; Dr. Bidschof, 571; Return of
Brorsen's Comet, Dr. E. Lamp, 69; Comet Davidson (c
1889, 88; D'Arrest's Comet, G. Leveau, 596; a New Comet
(f 1889, November 17) discovered by Lewis Swift, 69; Dr. 1839, 88; D Arrest's Comet, Gr. Leveau, 590; a New Comet (f 1889, November 17) discovered by Lewis Swift, 69; Dr. Zelbr, 115, 233; Dr. R. Schorr, 139; Dr. Lamp, 233; Orbit of Swift's Comet (V. 1880), 257; Nuclei of Great Comet (II. 1882), F. Tisserand, 358, 522; Periodic Comets, 139; the Orbit of Winnecke's Periodical Comet, M. H. Faye,

Compass on Board, the, 412
Conductivity in Flin's, a Natural Evidence of High Thermal,
Prof. A. S. Herschel, F. R. S., 175
Congenital Variation, Acquired Characters and: the Duke of Congenital Variation, Acquired Characters and: the Duke of Argyll, F.R.S., 173, 294, 366; W. T. Thiselton Dyer, F.R.S., 315; F. V. Dickins, 316; Kight Rev. Bishop R. Courtenay, 367; Dr. J. Cowper, 368; Herbert Spencer, 414; Prof. E. Ray Lankester, F.R.S., 415 Congress, Moscow Archaeological, 283 Conroy (Sir John), Luminous and Non-Luminous Radiation of Concelled 2019.

Constable (F. C.), Fighting for the Belt, 199
Constellations, Large Scale Charts of the, Arthur Cottam, 45
Continents and Oceans, the Permanence of, Joseph John Murphy, 175
Cook (Charles S.), Spectrum of Aqueous Vapour, 598
Cooke (M. C.), Toilers in the Sea, 409
Cope (Prof. E. D.): Lamarck versus Weismann, 79; on the

Causes of Variation, Prof. E. Ray Lankester, F.R.S., 128 Copenhagen, the Lund Museum in the University of, 26

Copernican System of Astronomy, is it True? W. S. Cassedy, 366

Copper, the Spectrum of Subchloride of, Prof. A. S. Herschel, F.R.S., 513
Copper, Volumetric Estimation of, Etard and Lebeau, 431
Coral Reefs, Examination of the Structure of, Angelo Heilprin, Dr. H. B. Guppy, 193

Coral Reefs of the Java Sea and its Vicinity, Dr. H. B. Guppy,

Coral Reefs in Recent Seas, Dr. John Murray, 167 Corday's (Charlotte) Skull, Dr. Topinard, 500

Cormorant, Pallas's, 373 Cornish (Thos.), the Old English Black Rat in Cornwall, 161

Corona of January 1, 1889, Prof. Tacchini, 139 Corona of 1889, December 22, W. H. Wesley, 450 Coronal Light, Photometric Intensity of, Prof. Thorpe, 139

Corpi (F. M.), the Catastrophe of Kantzorik, Armenia, 190 Corsican Population, Cephalic Index of, Dr. A. Fallot, 357
Cory (Dr. Robert), History and Pathology of Vaccination, E.
M. Crookshank, 486
Cosson (M.), Death of, 230
Costa Rica, Meteorology of, Boletin Trimestral of San José

Observatory, 427
Cotes (E. C.), Locusts in India, 403
Cottam (Arthur) Large Scale Charts of the Constellations, 45
Courtenay (Right Rev. Bishop R.), Acquired Characters and
Congenital Variation, 367

Cowper (Dr. J.), Acquired Characters and Congenital Varia-

Cowper (Dr. J.), Acquired Characters and Congolial tion, 368
Crabs, Foreign Substances attached to: Francis P. Pascoe, 176; F. Ernest Weiss, 272; Alfred O. Walker, 296; Captain David Wilson-Barker, 297; Dr. R. von Lendenfeld, 317; Prof. W. A. Herdman, 344; Walter Garstang, 417, 490, 538; Ernest W. L. Holt, 463, 515, 586
Cradle of the Aryans, the, Gerald H. Rendall, 128

Craig (Thomas), a Treatise on Linear Differential Equations, 508

Craters, Changes in Lunar, Prof. Thury, 183
Creak (E. W., F.R.S.), Report on the Magnetical Results of the Voyage of H.M.S. Challenger, 105
Creation and Physical Structure of the Earth, J. T. Harrison,

Criminals, Identification of, by Measurement, Jacques Bertillon,

Crismer (M.), New Compound of Hydroxylamine with Metallic

Crismer (M.), New Compound of Hydroxystams Chlorides, 401
Croft (W. B.), Electrical Figures, 132
Croll (Dr. James, F.R.S.), Former Glacial Periods, 441
Crookshank (E. M.), History and Pathology of Vaccination,
Dr. Robert Cory, 486
Cross (C. 1.) Academics of Cellulose, 142; the Constituents Cross (C. J.), Acetylation of Cellulose, 142; the Constituents

of Flax, 193 Crosthwaite (R. J.), Wanton Destruction of Forests in India,

Crows, the Food of, W. B. Barrows, 137
Crustaceans, Discovery by Prof. Giard of Micro-organism conferring Phosphorescence on, 137
Cryptogamic Botany, the Revised Terminology in, Alfred W.

Bennett, 225

Crystal Palace, International Exhibition of Mining and Metal-

lurgy, 592
Crystals of Lime, H. A. Miers, 515
Cundall (J. T.), Production of Ozone by Flames, 502
Cunningham (J. T.), Anchovies on South Coast of England,

Curtius (Dr.), Hydrazine, 547

Cyclamen in Savoy, Threatened Extinction of, 569 Cygni, Y, Variable Star, 88

Cyprus, Lieut.-General Sir Robert Biddulph, 45

Daffodils, Double Varieties of, 593 Daily Graphic, the, 66

Dalmatia, Earthquakes in, 136 Dana (Prof. James D.), Sedgwick and Murchison, Cambrian and Silurian, 421

Danckelmann (Dr. von): Meteorology of Gold and Slave Coast, 479; Climate of German Togoland, 545 Danish Expedition to East Coast of Greenland, the Proposed,

Darwin (Prof. G. H., F.R.S.), Microseismic Vibration of the

Earth's Crust, 248
Darwin, Before and After, Prof. G. J. Romanes, F.R.S., 524
Darwin's and Lamarck's Theories as to Transmission of

Darwin's and Lamarck's Theories as to Transmission of Acquired Characters, Prof. E. R. Lankester, F.R.S., 486 Darwin's Voyage of a Naturalist, New Edition, 495 Darwinian Theory, and Acquired Characters and Congenital Variation, 368; Herbert Spencer, 414; Prof. E. Ray Lankester, F.R.S., 415

E

E

a t: 3 4 4 ti

a F R E

ESMT

59 Elei Ellis

Ellis

Eng

Eng Engi

II Eme

Darwinian Theory and Evolution, Rev. John T. Gulick, 309
Darwinians, Neo-, the Duke of Argyll and the, W. T. Thiselton Dyer, F.R.S., 247
Darwinism: Prof. E. Ray Lankester, F.R.S., 9; Prof. Geo. J. Romanes, F.R.S., 59; some Notes on Dr. A. R. Wallace's, by T. D. A. Cockerell, 393; and Panmixia, Prof. Geo. J. Romanes, F.R.S., 437
Daubrée (M.), Analogy of South African Diamantiferous Matrix to Materials 363

to Meteorites, 263

Dauvergne's Journey in North-West Cashmere, 165
Davidson's Comet (e 1889), 429
Davis (John), a Life of, Clements R. Markham, F.R.S., 52
Davison (Chas.), Supposed Earthquake at Chelmsford on

January 7, 369
Dawkins (Prof. W. Boyd, F.R.S.), Discovery of Coal near Dover, 418
Dawson (Sir J. W., F.R.S.): Fossil Rhizocarps, 10; Certain

Devonian Plants from Scotland, 537

Day (Francis), Fishes, 101

Deformation of an Elastic Shell, Prof. Horace Lamb, F.R.S.,

549 Dehérain (P. P.), the Exhaustion of Soils cultivated without Manure, and Value of Organic Matter in Soil, 119 Delachanal, Vincent and, Sorbite, 23

Delachanal, Vincent and, Sorbite, 23
Demography and Hygiene, Congress on, 401
Denniker (M.), Classification of Races, based on Physical
Characters only, 332
Denning (W. F.), Recent Observations of Jupiter, 206
Dentine and Bone, the Longevity of Textural Elements, particularly in, John Cleland, 392
Dentition, a Milk, in Orycteropus, O. Thomas, 309
Derbyshire, the Flora of, by the Rev. W. H. Painter, 77
Descartes and his School, Prof. Kuno Fisher, 171
Descrit of Atacama, on the Supposed Enormous Showers of

Desert of Atacama, on the Supposed Enormous Showers of Meteorites in the, 108 Deslandres (H.): Fundamental Common Property of Two Kinds

of Spectra, Lines and Bands; Distinct Characteristics of each of the Classes; Periodic Variations to Three Parameters, 576 Deslongchamps (M. Eugène), Death and Obituary Notice of,

Deutschen Seewarte': Annual Report of, 85; Meteorological Observations, 231

Dewar's (D.) Weather and Tidal Forecasts for 1890, 546

Diamine (Diethyline), Dr. J. Sieber, 428 Diamonds, the Formation of, M. Daubrée, 263

Dianthus, Enumeratio Specierum Varietatumque Generis, F. N.

Williams, 51 Dianthus, Notes on the Pinks of Western Europe, by F. N. Williams, 78

Dibasic Organic Acids, a New Synthesis of, Prof. Crum Brown,

431 Dickins (F. V.), Acquired Characters and Congenital Variation,

Dickinson (W. L.), Local Paralysis of Peripheral Ganglia and Connection of Nerve-fibres with them, 118

Dierckx (G.), Sun-spot in High Latitudes, 472 Differential Equations, a Treatise on Linear, Thomas Craig, 508

Differential Equations, a Treatise on Ordinary and Partial, Prof. W. W. Johnson, 270

W. W. Johnson, 270
Digestions, a Comparative Study of Natural and Artificial, A. S. Lea, 430
Dines (W. H.), Anemometers, 212
Diseases of Plants, Prof. H. Marshall Ward, F.R.S., 436
Diseases, Tropical, the Relation of the Soil to, A. Ernest

Roberts, 31
Distant (W. L.), Monograph on Oriental Cicadida, 161 Disturbed Water, on the Effect of Oil on, A. B. Basset, F.R.S.,

Ditte (A.), Action of Sulphuric Acid on Aluminium, 503
 Divers (Dr. E., F.R.S.), Oxyamido-sulphonates and their Conversion into Hyponitrites, 143
 Dobbins (J. R.), Spread of the Australian Ladybird in California,

161

Dog, the, M. de Mortillet, 332 Dogs and Music, 372 Double-star Observations: S. W. Burnham, 19, 472; E. E. Barnard, 19

Double Stars, New, Miss A. M. Clerke, 132 Doumer (E.), Refracting Powers of Simple Salts in Solution,

Doumer (E.), Refracting Powers of Double Salts in Solution,

Dover, Discovery of Coal near, Prof. W. Boyd Dawkins, F.R.S., 418

Dreams, Dr. Julius Nelson, 546
Du Chaillu (Paul B.), the Viking Age, 173
Duchayla's Proof, Prof. J. D. Everett, F.R.S., 198
Dumont (M.), Natality of Paimpol, 332
Dun Echt Observatory, 351

Dun Echt Observatory, 351
Dundea Technical Education Association, 113
Dunman (T.), a Glossary of Anatomical, Physiological, and Biological Terms, 173
Dunn (J.), a Remarkable Meteor, 560
Dunstan (Prof.), Apparatus for distilling mercury in vacuo, 526
Dust, Atmospheric, Dr. Marcet, 358, 473
Dust, the Motion of, Hon. Ralph Abercromby, 406
Dust Particles, the Number of, in the Atmosphere of certain Places in Great Britain and the Continent, with Remarks on the Relation between the Amount of Dust and Meteorological the Relation between the Amount of Dust and Meteorological Phenomena, John Aitken, F.R.S., 394 Dutch East Indies, Science in, 547

Dutch India, Flora of, 461

Dwight (Jonathan, Jun.), Birds that have struck the Statue of
Liberty in New York Harbour, 181

Dyer (W. T. Thiselton, F.R.S.): the Duke of Argyll and the Neo-Darwinians, 247; Acquired Characters and Congenital Variation, 315

Dynamics, Elementary, of Particles and Solids, W. M. Hicks, F.R.S., 534

Earl (A. G.), Elements of Laboratory Work, 461 Earth and its Story, edited by Dr. Robert Brown, 341 Earth, on the Creation and Physical Structure of the, J. T.

Harrison, 151
Earth's Crust, Microseismic Vibration of the, Prof. G. H.
Darwin, F.R.S., 248
Earth-currents and the Occurrence of Gold, Geo. Sutherland,

Earth-tremors from Trains, H. H. Turner, 344
Earthquakes: Record of British Earthquakes, Charles Davison, 9; at St. Louis, 18; Earthquake of July 28, 1889, at Kiushiu, J. Wada, 23; Relation of certain Magnetic Per-Kiushiu, J. Wada, 23; Relation of certain Magnetic Perturbations to Earthquakes, M. Mascart, 23; the Earthquake of Tokio, April 18, 1889, Prof. Cargill G. Knott, 32; Earthquakes in Algeria and Servia, 113; in Italy, Dalmatia, Bosnia, and Herzegovina, 136, 181; at Granada, 161; British Earthquakes, William White, 202; Earthquakes in Turkestan, 230; the Earthquake of July 12 at Lake Issyk-kul, 230; Earthquakes at Chelmsford and in Perthshire, 256; Chas. Davison, 369; in Carinthia, 284; at Rome and in Portugal, 401; at Bonn and Malaga, 470; at Trieste, 519; in the United States, 569; in the Tyrol, 569
Earthworms from Pennsylvania, W. B. Benham, 560
Easter Island, Archæology and Ethnology of, Walter Hough, 569

509
Eastman (Prof. J. R.), on Solar and Stellar Motions, 351, 392
Eclipses: Eclipse Parties, 139; Total Solar, of 1886, Rev. S.
J. Perry, F.R.S., 88; H. H. Turner, 88; Dr. Schuster,
F.R.S., 327; Total Eclipse of December 22, 1889, 229;
M. A. De La Baume Pluvinel, 428; Total Eclipse of January 1, 1889, Prof. Holden, 305 Eder (Dr. J. M.), La Photographie à la Lumière du Magnésium,

584 Edinburgh International Exhibition, 85

Edinburgh International Exhibition, 85
Edinburgh Royal Society, 167, 214, 335, 358, 382, 431, 478, 575
Edison Phonograph, Use of, in Preserving American Indian
Languages, J. W. Fewkes, 560
Education: Physiology of Education, Mary Putnam Jacobi, 28;
Lord Salisbury on Free Education, 84; Education in Basutoland, Sir Marshall Clarke on, 86; Scientific Education in
China, the Question of Language, 162; the Need for Vital Improvements in English Education, Sir Lyon Playfair, 180: Improvements in English Education, Sir Lyon Playlar, 180: Association for Improvement of Geometrical Teaching, 207; Polytechnics for London, 242; Necessity of a School for Modern Oriental Studies, Prof. Max Müller, 255; the New Codes, English and Scotch, 385; Land Grants to Educational Institutions in U.S.A., 448; the Revised Instructions to Inspectors of Elementary Education, 577; Mathematical Teaching at Sorbonne, Prof. Ch. Hermite, 597; Technical Education in New South Wales and Bengal, 66; Conference at Manchester on Technical Education, 84; Dundee Technical Education Association, 113; the City Guilds and Technical Education, Sir H. E. Roscoe, M.P., F.R.S., 160; on the Future of our Technical Education, Sir Henry E. Roscoe, M.P., F.R.S., 183; Technical Education in Elementary Schools, 356; Technical Education in Central India, 470; a South London Polytechnic, 481; Technical Education Bill, Sir H. E. Roscoe, 493; Technical Education in the Code, 505 505

Eggs, Protective Coloration of, E. B. Titchener, 129; Dr. Alfred R. Wallace, 53; Rev. Fred. F. Grensted, 53

Alfred R. Wallace, 53; Rev. Fred. F. Grensted, 53 Egypt, Vandalism in, 447 Egyptian Civilization, Early, W. M. Flinders Petrie, 109 Eissler (M.), a Hand-book of Modern Explosives, 224 Elastic After-Strain, on a Certain Theory of, Prof. Horace Lamb, F.R.S., 463 Elastic Shell, Deformation of an, Prof. Horace Lamb, F.R.S.,

549 Elastical Researches of Barré de Saint-Venant, Prof. A. G.

Greenhill, F.R.S., 458
Electricity: Modern Views of Electricity, Dr. Oliver J. Lodge, F.R.S., 5, 80; Electrical Cloud Phenomena, Prof. W. K. Burton, 10; New Method of Measuring Differences of Poten-Burton, 10; New Method of Measuring Differences of Potential of Contact, Prof. Righi, 18; Institution of Electrical Engineers, 21; Magnetism and Electricity, Andrew Jamieson, 30; Specific Inductive Capacity, Prof. Oliver J. Lodge, F.R.S., 30; Siegsfeld's Electric Thermometer, 43; a Method of driving Tuning-Forks Electrically, W. G. Gregory, 47; a New Electric Radiation Meter, W. G. Gregory, 47; Electrifications due to Contact of Gases and Liquids, J. Enright, 47; Proceedings of the National Electric Light Association at its Ninth Convention, 50; Electric Light at the British Museum, 301; the National Electric Light at the British Museum, 301; the National Electric Light Association, 302; Magnetism and Electricity, Arthur W. Poyser, 52; a Proposed Gilbert Club, 84; the Edinburgh International Exhibition, 85; Variations of Electric Resistance of Nitric Peroxide at Various Temperatures, J. J. Boguski, 119; Electrical Figures, W. B. Croft, 132; the Arc Light, Joseph McGrath, 154; Effect of Repeated Heating and Cooling on Electrical Coefficient of Annealed Iron, Herbert Tomlinson, F.R.S., 166; Electrification due to Contact of Gases with Liquids, Enright, 166; Electrification of a Steam Jet, Shelford Bidwell, F.R.S., 213; Development of Electricity and Heat in Dilute Electrolytic Solutions. of a Steam Jet, Shelford Bidwell, F.R.S., 213; Development of Electricity and Heat in Dilute Electrolytic Solutions, Prof. Planck, 215; the Peltier Effect and Contact E.M.F., Prof. Oliver J. Lodge, F.R.S., 224; Electric Currents in Skin from Mental Excitation, Herr Tarchenoff, 232; Electrical Negative Variation of Heart accompanying Pulse, Dr. Aug. Waller, 288; Electric Splashes, Dr. S. P. Thompson, 309; On Galvanometers, Ayrton, Mather, and Simpson, 310, 381; Electrostatic Stress, Sir W. Thomson, F.R.S., 358; Easy Lecture Experiment in Electric Resonance, Prof. Oliver J. Lodge, F.R.S., 368; Determination of Coefficient of Dynamic and Electromotor Produce, P. Guzzi, 380; Electrical Resistance of Iron Alloys at High Temperatures, H. Le Chatelier, 383; Electrical Resistance, Measurement of, Dr. Feussner, 407; Electrical Oscillations in Rarefied Air, M. James Moser, 431; Magnetism and Electricity, Prof. Jamieson, 461; Electrical Radiation from Conducting Spheres, an Electric Eye and a Suggestion Regarding Vision, Prof. Oliver J. Lodge, F.R.S., 462; Use of Bolometer for Observing Electrical Radiations of Hertz, Dr. Rubens, 504; Short Lectures to Electrical Artisans, J. A. Fleming, 561; Absolute Measurements in Electricity and Magnetism, Andrew Gray, 561; Electricity in Modern Life, G. W. de Tunzelmann, 561; Samples of Current, Electrical Literature, 561; Shape of Movable Coils used in, Electrical Measuring Instruments, T. Mather, 574; Prof. Stricker's New Electrical Lantern, 593 ment of Electricity and Heat in Dilute Electrolytic Solutions,

Elementary Physics, M. R. Wright, 78
Elementary Schools, Technical Education in, 356
Elephant Sketeton, Large Indian, 66
Ellis (Thos. S.), the Human Foot, 365
Ellis (Wm.), Relative Prevalence of North-East and South-West

Ellis (Wm.), Relative Prevalence of North-Last and Winds, 586
Emerson (P. H.), Naturalistic Photography, 366
Encyclopædie der Wissenschaften, 87
Engine Drivers, Colour-blind, 325
Engineer's Sketch-book, Thomas Walter Barber, 52
Engineers, Institution of Electrical, 21
Engines, Compound Locomotives, 331

n ;

o-in al o: 7;

wal

al

England, Railways of, W. M. Acworth, 434 Enright (J.), Electrification due to Contact of Gases and Liquids, 47, 166

47, 166
Entomology: the Metamorphosis of Anoura, E. Bataillon, 23; Entomological Society, 93, 191, 382, 503, 575; Presidential Address by Lord Walsingham, 334; Entomologist's Monthly Magazine, New Series, 161; Spread of the Australian Ladybird in California, J. R. Dobbins, 161; Extraordinary Abundance of Agrotis spina in New South Wales in October, A. S. Olliff, 161; Alexandria Garden Pest, R. W. Blunfield, 181; Temperature Experiments on Lepidoptera, F. Merrifield, 191; the Gizzard in Scolopendride, Victor Willem, 237; Sugar Losing its Attractions for Lepidoptera, 10seph Ander-Sugar Losing its Attractions for Lepidoptera, Joseph Anderson, 349; Sugar-cane Pests at St. Vincent, 372; Wax Organs of the Bee, G. Carlet, 407; Beetle-settlement in Disused Gasometers, T. H. Hall, 520; Introduction into California of Australian Natural Enemies of the Fluted Scale (*Icerya* purchasi), 569 Ephedra die Arten der Gattung, von Dr. Otto Stapf, 390

Epidemic of Influenza, 145
Equation, Roots of Algebraic, Prof. A. Cayley, 359
Equations, a Treatise on Linear Differential, Thomas Craig, 508 Equilibrium, a Case of Chemical, W. H. Pendlebury, 104

Ergot, Cattle-poisoning by, 569
Eschenhagen (Dr.), Potsdam Magnetic Observatory, 479
Espin (Rev. T. E.): S Cassiopeiæ, 115; Bright Lines in

Stellar Spectra, 549 Estuary, the Mersey, Effects of Training Walls in, L. F. V

Harcourt, 380
Estuary, the Thames, Captain Tizard, R.N., 539
Etheridge (R., Jun.), the Murrumbidgee Limestone, 67

Ethnology: the Leyden Ethnographical Collection, 180; Ethnography of Venezuela, Pre-Columbian, Dr. Marcano, 332; Ethnologic Affinity of Ancient Etruscans, Dr. Brinton, 66, 448; Sixth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1884-85, J. W. Powell, 99; Ethnology of the Philippine Islands, Dr. F. Blumentritt, 327; German Contributions to Ethnology, 433; Archæology and Ethnology of Easter Island, Walter Hough, 569; Internationale Archiv für Ethnographie, 594

Eton, Science at, Lieut.-General Tennant, F.R.S., 587 Etruscans, Ethnologic Affinity of Ancient, 66, 448 Ettingshausen (Dr. Constantin Freiherr von), Das Australische Florenelement in Europa, 365

Florenelement in Europa, 365
Euclid, the Study of, 80
Everett (Prof. J. D., F.R.S.): Duchayla's Proof, 198; Traité
d'Optique, M. E. Mascart, 224
Every-day Life, Science of, J. A. Bower, 78
Evolution and the Darwinian Theory, Rev. John T. Gulick, 309
Evolution of Sex: M. S. Pembrey, 199; Dr. A. B. Meyer, 272;
Prof. Patrick Geddes and Arthur Thomson, 531
Ewart (Prof. J. C.): Sardines in Moray Firth, 282; Cranial
Nerves of Torpedo, 477; Development of Ciliary Ganglion,
501

Exact Thermometry: Herbert Tomlinson, F.R.S., 198; Dr. Sydney Young, 271 Exhibition illustrating Application of Photography and Meteoro-

logy, Proposed, 301 Exhibition, Bournemouth Industrial and Loan, Science Exhibits

in, 545 Exhibition of Mining and Metallurgy, Proposed International, 447 Exhibition, Paris: English Men of Science decorated, 17;

Exhibition, the Proposed Berlin International Horticultural, 283 Explosives, a Hand-book of Modern, M. Eissler, 224
Explosives, Smokeless, Sir Frederick Abel, F.R.S., 328, 352
Exton (Dr. H.), Geology of Witwatersrand Gold-fields, 190
Eye, the, Cortical Visual Areas, Prof. Munk, 407

Fall of Miner down a 100-Metre Shaft without being Killed, M.

Reumeaux, 471
Fallot (Dr. A.), Cephalic Index of Corsican Population, 357
Farne Islands, Bird-Preservation in the, H. G. Barclay, 112 Fauna of British India, including Ceylon and Burmah, 101

Fauna of Mergui and its Archipelago, 556
Faye (M. H.), the Orbit of Winnecke's Periodical Comet, 94
Feilden (Col. H. W.), the Barbados Monkey, 349
Fermentation, the Micro-organisms of, practically considered,

Alfred Jörgensen, Prof. Percy F. Frankland, 339

Fern, Sweet-scented, 349 Fern, Sweet-scented, 349
Ferrel (William), a Popular Treatise on the Winds, 124
Feussner (Dr.), Measurement of Electrical Resistance, 407
Fewkes (J. W.), Use of Edison Phonograph in Preserving
American Indian Languages, 560
Fichte (Johann Gottlieb), the Popular Works of, 294
Field Experiments on Wheat in Italy, Prof. Giglioli, 404
Field laid down to Permanent Grass, Sir J. B. Lawes, F.R.S.,

Fievez (Ch.), Death and Obituary Notice of, 400 Fighting for the Belt, F. C. Constable, 199 Fiji, Sea-water Cure for Banana Disease in, 19

Fig. Sea-water Care for Bahana Disease in, 19
Finland, the Secular Upheaval of Coasts of, 348
Fire-damp, Explosions in Mines in Relation to Cosmic and
Meteorological Conditions, Dr. Wagner, 504
Fischer-Sigwart (Herr), Snake and Fish, 162
Fisher (Prof. Kuno), History of Modern Philosophy, Descartes

and his School, 171 Fisher (Rev. Osmond): on the Physics of the Sub-Oceanic Crust, A. J. Jukes-Browne, 54; Does the Bulk of Ocean Water

Increase, 197
Fisher (Robert), Flower-Land, an Introduction to Botany, 247
Fisher (Robert), Flower-Land, and Introduction to Botany, 247 Fisheries, Foreign, Administration of, Prof. W. C. McIntosh,

F.R.S., 497 Fishery Industries of the United States, George Brown Goode,

178

178
Fishes: the Habits of the Salmon, Major John P. Traherne,
74; Dr. René du Bois Reymond on the Striated Muscles of
Tench, 95; Prof. Fritsch on the Sensory Organs of the Skin
of Fishes, 95; Fishes, Francis Day, 101; the Bladder in
Fishes, Prof. Liebreich, 359
Fitzgerald (Captain C. C. P., R.N.), Leak-stopping in Steel
Shine E16

Ships, 516 Fitzgerald (Prof. Geo. Fras.), Multiple Resonance obtained in

Hertz's Vibrators, 295
Five Months' Fine Weather in Canada, Western U.S., and

Mexico, Mrs. E. H. Carbutt, 247

Fleming (J. A.), Short Lectures to Electrical Artisans, 561
Fletcher (Thos.), Coal Gas as a Fuel, 471
Flimm (Dr.), New Method of Synthesizing Indigo, 326
Flint Remains in Kolaba District, W. E. Sinclair, 114

Flints, a Natural Evidence of High Thermal Conductibility in,

Prof. A. S. Herschel, F. R. S., 175
Flora of China, 46
Flora of Derbyshire, Rev. W. H. Painter, 77
Flora of Keeling Islands, W. B. Hemsley, F. R. S., 492
Flora of the Malayan Peninsula, Materials for a, Dr. George

Flora of the Malayan Peninsula, Materials for a, Dr. George King, F.R.S., 437
Flora of Suffolk, Dr. W. M. Hind, 149
Flow of Water in Rivers and other Channels, a General Formula for the Uniform, E. Ganguillet and W. R. Kutter, 411
Flower (Prof. W. H., F.R.S.): Who Discovered the Teeth in Ornithorhynchus?, 30, 151; Suggestions for the Formation and Arrangement of a Museum of Natural History in Connection with a Public School. 177

tion with a Public School, 177 Flower-Land, an Introduction to Botany, Robert Fisher, 247 Fluorine: a New Method of Preparing, Henri Moissan, 117, 138; Colour and Spectrum of, Henri Moissan, 214

Fluoroform, Isolation of, M. Meslans, 521

Fluoroform, isolation oi, M. Mesians, 521
Fog, Effects of, on Plants under Glass, 372
Folk-Lore, Customs of the Akas, 86
Foot, the Human, Thos. S. Ellis, 365
Foot-Pounds, 298; Prof. A. G. Greenhill, F.R.S., 317
Forbes (H. O.), Discovery of Maori Cave-dwellings, 209
Forces, Proof of the Parallelogram of, W. E. Johnson, 153;
Prof. A. G. Greenhill, F.R.S., 298
Forcessiting Weather, 278

Prof. A. G. Greenhill, F.R.S., 298
Forecasting, Weather, 278
Foreign Substances Attached to Crabs: Francis P. Pascoe, 176; F. Ernest Weiss, 272; Alfred O. Walker, 296; Captain David Wilson-Barker, 297; Dr. R. von Lendenfeld, 317; Prof. W. A. Herdman, 344; Walter Garstang, 417, 490, 538; Ernest W. L. Holt, 463, 515, 586
Foreshadowing of the Periodic Law, a First, P. J. Hartog, 186
Forest Surveys of India, 140
Forestry in India, Dr. Schlich, 470
Forestry in Singapore, Noxious Grass, Lalang, 182
Forestry, Major-General Michael, 348
Forestry, a Manual of, William Schlich, Sir D. Brandis, F.R.S., 121

Forestry, Punjab Forest Administration Report, 520 Forests in India, Wanton Destruction of, R. J. Crosthwaite, 210

Fort William Meteorological Observatory, 518
Forth Bridge: Testing of the New, 281; Opening of the, 429
Fossil Plants of Coal-Measures, Organization of, Prof. W. C.

Fossil Rhizocarps: Sir J. Wm. Dawson, F.R.S., 10; Alfred

Fossil Rhizocarps: Sir J. Will. Dawson, 1. R. S., R., S., W. Bennett, 154

Fowler (A.): Karlsruhe Observatory, 20; Objects for the Spectroscope, 20, 44, 68, 87, 114, 138, 163, 183, 210, 232, 256, 285, 304, 326, 350, 374, 402, 428, 449, 472, 496, 521, 548, 571, 595; Note on the Zodiacal Light, 402

Fowler (G. J.), Influence of Different Oxides on Decomposition of Potassium Chlorides, 502

of Potassium Chlorides, 502
France: Travels in, Arthur Young, 294; La France Préhistorique, Emile Cartailhac, 102; Brazilian Honours to French Astronomers, 135; French Meteorological Society, 161; French Scientific Missions under the Old Monarchy, Dr.

Frankland (Prof. Percy F.), the Micro-Organisms of Fermenta-tion practically considered, Alfred Jörgensen, 339 Fraser (George), Maltese Butterflies, 199 Free Education, Lord Salisbury on, 84 Freehfield (Douglas W.), Search and Travel in the Caucasus,

Fritsch (Prof.): on the Sensory Organs of the Skin of Fishes, 95; Anatomy of *Torpedo marmorata*, 263 Frost (Dr. Percival, F.R.S.), Eight Rainbows seen at the same

Time, 316

Future of our Technical Education, on the, Sir Henry Roscoe,
M.P., F.R.S., 183

Future Indian Civil Service Examinations, 265

Gairdner (W. T.), the Physician as Naturalist, 436 Galls: Prof. G. J. Romanes, F.R.S., on, 80, 174, 369; R. McLachlan, F.R.S., 131; D. Wetterhan, 131; W. Ainslie Hollis, 131, 272; Dr. St. George Mivart, F.R.S., 174; T.

Hollis, 131, 272; Dr. St. George Mivari, F.R.S., 174; 1. D. A. Cockerell, 344, 559
Galton (Francis, F.R.S.), Cambridge Anthropometry, 454
Galvanometers: Ayrton, Mather, and Sumpner, 310, 381; Reflecting, Geometrical Construction of Direct-reading Scales for, A. P. Trotter, 478
Ganguillet (E.) and W. R. Kutter, a General Formula for the Uniform Flow of Water in Rivers and other Channels, 411
Garden, the Birds in my, W. T. Greene, R. Bowdler-Sharpe,

Gardiner (Prof. Walter): on a New Application of Photography to the Demonstration of Physiological Processes in Plants, 16; how Plants maintain themselves in the Struggle for Existence, 90

Gardner (J. Starkie), Physics of the Sub-oceanic Crust, 103 Garrett (T. A.) and W. Lucas, Wimshurst Machine and Hertz's Vibrator, 515 Garstang (Walter), Foreign Substances attached to Crabs, 417,

Gas-flame, Luminous and Non-luminous Radiation of, Sir John

Conroy, 357 Gas Measurement, Improved Apparatus for, Prof. Lunge, 471
Gauge, Bourdon's Pressure, Prof. A. G. Greenhill, F.R.S., 517
Gauthier-Villars (H.), Eder's Photographie à la Lumière du
Magnésium, translated by, 584
Geddes (Prof. Patrick) and Arthur Thomson, Evolution of Sex,

531
Geodesy: a Bibliography of, J. Howard Gore, 9; the Measurement of the Peruvian Arc, E. D. Preston, 309; Geodetic Surveys of India, 14)

Ge

Ge Ge Ge Ge Ge Gia

Surveys of India, 14)
Geography: Geographical Notes, 20, 45, 164, 234, 286, 327, 351, 374, 403, 472, 571; Geographical Results of Stanley's Expedition, 20, 73, 111; the North Coast of New Guinea, Admiral von Schleinitz, 21; Reported Massacre of Dr. Peters's Party, 21; Cyprus, Lt.-General Sir Robert Biddulph, 45; Physics of the Sub-oceanic Crust, Rev. Osmond Fisher, A. J. Jukes-Browne, 53; Teacher's Manual of Geography, J. W. Redway, 78; Exploration of the Musgrave Ranges, Australia, 86; Death of Major P. E. Warburton, 164; Death of Cardinal Massaja, 164; the Ascent of Kilimanjaro, Meyer and Purtscheller, 164; the South African Gold-fields, G. D. Cocorda, 164; Arrival of Captain Trivier at Mozambique, 165; M. Thoroddsen's Explorations in Iceland, 165; Dauvergne's Journey in N. W. Cashmere, 165; Geography in Russia, Baron Kaulbars, 208; Colonel Roborovski's Expedition in Central Asia, 234; Prof. Kuekenthal's Researches in tion in Central Asia, 234; Prof. Kuekenthal's Researches in

King Charles Land, 234; a Thousand Miles on an Elephant in the Shan States, Holt S. Hallett, 265; the Lesser Antilles, by Owen T. Bulkeley, 268; Tietkens's Explorations in Central Australia, 286; Tavernier's Travels in India, translated by V. Ball, F.R.S., 313; Area of Austro-Hungarian Empire, Dr. Penck, 325; Discovery of Pass from Nia to Tibet by Colonel Pevisoff and M. Roborovsky, 327; Search and Travel in the Caucacus, Douglas W. Freshfield, 351; the Russian Expeditions in Central Asia, 352; Dr. Nansen's Plan for a North Polar Expedition, 374; Sir Wm. McGregor's Explorations in New Guinea, 274; a Trip, through the Plan for a North Polar Expedition, 374; Sir Wm. McGregor's Explorations in New Guinea, 374; a Trip through the Eastern Caucasus, by the Hon. John Abercromby, 391; Further Explorations of Solomon Islands, C. M. Woodford, 403; proposed Danish Exploration of Greenland, 403; Geographical Society of Vienna, 403; Bartholomew's Library Reference Atlas of the World, 413; Hues's Treatise on the Globes (1592), 459; Limits of Ever-frozen Soil in Siberia, Vatcheria, 473; Diminution in Population of Legand 473.

Globes (1592), 459; Limits of Ever-frozen Soil in Siberia, Yatchevsky, 472; Diminution in Population of Iceland, 473; Climate of German Togoland, Dr. von Danckelmann, 545; Facsimile Atlas to the Early History of Cartography, by A. E. Nordenskiöld, 558; Dr. Hans Meyer's Ascent of Kilima-Njaro, 572; Modigliani's Exploration of Nias Island, Prof. Giglioli, 587; a Naturalist among the Head-hunters, C. M. Woodford, 582
Geology: Indian Geological Survey, Death of E. J. Jones, 41; Geolog Survey of India, 140; Formation of the Earth's Crust, Le Conte, 46; Chemical and Physical Studies in the Metamorphism of Rocks, Rev. A. Irving, 49; the Murrumbidgee Limestone, R. Etheridge, Jun., 67; an Elementary Text-book of, by W. Jerome Harrison, Prof. A. H. Green, F. R. S., 75; Dr. Hermann Burmeister on the Fossil Horses and other Mammals of Argentina, 82; Geological Society, P.R. S., 75; Dr. Hermann Burmeister on the Fossii Flores and other Mammals of Argentina, 82; Geological Society, 94, 190, 238, 310, 333, 382, 502, 527, 550; Medals awarded by the Geological Society, 301; Presidential Address at the Geological Society, Dr. Blanford, F.R.S., 455; Physics of the Sub-oceanic Crust, J. Starkie Gardner, 103; Geological Excursion to the Active and Extinct Volcanoes of Southern Excursion to the Active and Extinct Volcanoes of Southern Italy, 133; Dr. W. Hind on the Geology of Suffolk, 149; on the Creation and Physical Structure of the Earth, by J. T. Harrison, 151; Glaciation of Valleys in Kashmir Himalayas, Captain Stiffe, 190; Geology of Witwatersrand Gold-fields, Dr. H. Exton, 190; the South American Pampas Formation, Captam Stille, 190; Geology of Witwatersrand Gold-helds, Dr. H. Exton, 190; the South American Pampas Formation, Herr Roth, 231; Occurrence of Girvanella Genus, and on Oolitic Structure, E. Wethered, 238; Relation of Pebbly Sands of Suffolk to those of Norfolk, Parts II. and III., Prof. Joseph Prestwich, F.R.S., 238, 502; H. S. Williams on the Devonian System, 309; some British Jurassic Fish Remains, A. S. Woodward, 310; the Pebidian Volcanic Series of St. David, Prof. C. L. Morgan, 311; Terraced Hill Slopes of the Midlands, E. A. Walford, 325; Crystalline Schists and their Relations to Mesozoic Rocks in Lepontine Alps, Prof. T. G. Bonney, F.R.S., 333; Geological Mechanism, by J. Spottiswoode Wilson, 390; Sedgwick and Murchison, Cambrian and Silurian, Prof. James D. Dana, 421; Former Glacial Periods, Dr. James Croll, F.R.S., 441; Mica in Mourne Mountain Granite Geodes, Prof. Sollas, F.R.S., 469; Geologische Uebersichtskarte der Alpen, Dr. Franz Noë's, Prof. T. G. Bonney, F.R.S., 483; a Geological Map of the Alpine Chain, Prof. T. G. Bonney, F.R.S., 483; a Deep Channel of Drift in the Valley of the Cam, Essex, W. Whitaker, 527; Geology of the Quicksilver Deposits of the Pacific Slope, G. F. Becker, 532; certain Devonian Plants from Scotland, Sir Leology of the Quicksilver Deposits of the Pacific Slope, G. F. Becker, 532; certain Devonian Plants from Scotland, Sir J. W. Dawson, F.R.S., 537; Composite Spherulites in Obsidian from Hot Springs near Little Lake, California, Frank Rutley, 551; Magnetic Surveys of Special Districts in the British Isles, Profs. A. W. Rucker, F.R.S., and T. E. Thorpe, F.R.S., 598

Geometry: How not to Teach Geometry, Herbert J. Woodall, 60; Geometrical Teaching, 80; Association for the Improve-ment of Geometrical Teaching, 207; Oxford "Pass" Geometry, 467

Geophilus maritimus, Edward Parfitt, 153

Geoman Chemical Society, 468
German Contributions to Ethnology, 433
Germany, Zoogeography, Wolves, &c., in, Dr. Lampert, 182
Germination, Retarded, 31

Gernez (D.), Malic Acid and its Compounds, 94 Giard (Prof.), Discovery of Micro-organism conferring Phosphorescence on Crustaceans, 137 Gibb (Thomas), Text-book of Assaying, C. Beringer and J. J.

Beringer, 245

Giffen (Robert): Accumulations of Capital in the United Kingdom in 1875-85, 211; the Growth of Capital, 553 Giglioli (Prof.): Field Experiments on Wheat in Italy, 404; Modigliani's Exploration of Nias Island, 587

Gilbert Club, Proposed, 84, 112 Giles (Ernest), Australia Twice Traversed, 341 Gill (Dr.), Minor Planet (12), Victoria, 139

Girard (Jules), Recherches sur les Tremblements de Terre, 583 Glacial Periods, Former, Dr. James Croll, F.R.S., 441

Glaciation of Valleys in the Kashmir Himalayas, Captain Stiffe,

Glaisher (J. W. L., F.R.S.), the Method of Quarter Squares, 9 Glatzel (Dr.), New Mode of Preparing Manganese, 67 Glimpses of Animal Life, W. Jones, 409 Globes, Hues's Treatise on the (1592), 459

Globular and other Forms of Lightning, Reuben Phillips, 58

Glories, A. P. Coleman, 154 Glossary of Anatomical, Physiological, and Biological Terms, T. Dunman, 173

Glow of Phosphorus, Prof. T. E. Thorpe, F.R.S., 523 Gold, Earth-currents and the Occurrence of, Geo. Sutherland,

Gold Exploration in British North Borneo, 182

Gold in Suspension, Fungoid Growths in, 96 Goldscheider (Dr.), Sensitiveness of Articular Surfaces of Joints, 528

Goode (George Brown), Fishery Industries of the United States,

Gore (J. E.), Scenery of the Heavens, 391 Göttingen Royal Society of Sciences, 600 Graham (Robert H.), Newton in Perspective, 439

Granada, Earthquake at, 161

Grant (J.), Influence of Different Oxides on Decomposition of

Potassium Chlorides, 502 Grass, a Field laid down to Permanent, Sir J. B. Lawes, F.R.S., 229

Grasses, How to Know, by their Leaves, A. N. M'Alpine, Prof. John Wrightson, 557

Grasses of the Southern Punjab, Illustrations of some of the,

crasses of the Southern Punjab, Illustrations of some of the, being Photo-lithographs of some of the Principal Grasses found at Hissar, William Coldstream, 533

Gravitation: the Constant of, C. V. Boys, F.R.S., 155; Resonance Method of measuring Constant of, J. Joly, 256

Gravitation, Velocity of the Propagation of, J. Van Hepperger,

Gray (Andrew), Absolute Measurements in Electricity and Magnetism, 561

Gray (Dr. Asa), Scientific Papers of, W. Botting Hemsley,

F.R.S., 221 Greatheed (W.), Influenza, 270 Greely (General), Bibliography of Meteorology, 303 Green Vegetable Colouring-matter, a New, C. Michie Smith,

Green (Prof. A. H., F.R.S.): an Elementary Text-book of

Geology, W. Jerome Harrison, 75 Green (J. R.), Germination of Castor-oil Plant Seed, 380 Greene (W. T.), the Birds in my Garden, R. Bowdler Sharpe,

Greenhill (Prof. A. G., F.R.S.): the Parallelogram of Forces, 298; Foot-pounds, 317; the Life and Work of G. A. Hirn, 323; the Elastical Researches of Barré de Saint-Venant, 458; Bourdon's Pressure Gauge, 517 Greenish Meteor, a, T. D. A. Cockerell, 369 Greenland, is it our Arctic Ice Cap?, S. E. Peal, 58 Greenland, the Proposed Danish Expedition to the East Coast

of, 403, 545 Greenwich Observatory, 305; Meteorological Observations for

Greenwich Observatory, 305; Meteorological Observations for 1887 at, 570
Gregory (W. G.): a New Electric Radiation Meter, 47; a Method of Driving Tuning-forks Electrically, 47
Grensted (Rev. Fred. F.), Protective Coloration of Eggs, 53
Griffiths (Dr. A. B.), Manures and their Uses, 222, 272
Grombchevsky (Colonel), in Central Asia, 352
Ground-movements, Periodic, Plantamour, 373
Groves (Chas. E., F.R.S.), Systems of "Russian Transliteration," 534

tion," 534 Growth of Capital, Robert Giffen, 553 Guillaume (Ch. Ed.), Traité pratique de la Thermométrie de précision, Dr. Edmund J. Mills, F.R.S., 100 Guillemard (Dr. F. H. H.), a Naturalist in North Celebes,

Sydney Hickson, 457

Gulia (Dr.), Death and Obituary Notice of, 302 Gulick (Rev. John T.): Evolution and the Darwinian Theory, 309; "Like to Like," a Fundamental Principle in Bionomics,

Gull (Sir William), Death of, 324
Guppy (Dr. H. B.): a Contribution to the Physical History and Zoology of the Somers Archipelago, with an Examination of the Structure of Coral Reefs, Angelo Heilprin, 193; Coral Reefs of the Java Sea and its Vicinity, 300; the Dispersal of Plants, as Illustrated by the Flora of the Keeling Islands, 402

Gurney (Henry Palin), Science and the India Civil Service Examinations, 53

Guzzi (P.), Determination of Coefficient of Dynamic and Electromotor Produce, 380

Haga (T.), Oxyamidosulphonates and their Conversion into

Hyponitrites, 143
Hagen (Dr. B.), the Malay Peoples, 21
Hagen (Rev. John G.), Observations of some Suspected

Hagen (Rev. John G.), Observations of some Suspected Variables, 233
Hailstones: Remarkable, at Philadelphia, Prof. E. J. Houston, 43; Remarkable, G. J. Symons, F.R.S., 134
Hailstorms in Northern India, S. A. Hill, 236
Hake (H. W.), Coloured Analytical Tables, 29
Hall (Asaph), Mass of Saturn, 429

Hall (Maxwell), on the Spectrum of the Zodiacal Light, 351, 402 Hall (T. H.), Beetle Settlement in Disused Gasometers, 520

Haller (A.), the a Dextro- and Lævo-rotatory Borneol Camphorates, 503 Hallett (Holt S.), a Thousand Miles on an Elephant in the

Shan States, 265
Halos, Solar, and Parhelia, J. Lovell, 560
Hamburg: Interesting Remains Discovered in, 21; Groundwater Variations and the Typhus Epidemic, 570
Hampshire, Characteristic Survivals of Celts in, T. W. Shore,

406

Hamy (Dr.), French Scientific Missions under Old Monarchy, 427 Handtmann (Pastor), Inheritance of Acquired Mental Peculiarity, 200

Harcourt (L. F. V.), Effects of Training Walls in Mersey Estuary,

Hardening and Tempering of Steel, Prof. W. C. Roberts-Austen, F.R.S., on the, 11, 32
Harding (Chas.): Weather in January, 425; on the Cold in March 1890, 598
Harker (Alfred), the Bala Volcanic Series of Caernaryonshire and Associated Rocks, being the Sedgwick Prize Essay for

1888, 414 Harris (P. A.), Brilliant Meteors, 105 Harris (Walter B.), the Land of an African Sultan, 270 Harrison (J. T.), on the Creation and Physical Structure of the

Earth, 151
Harrison (W. Jerome), an Elementary Text-book of Geology, Prof. A. H. Green, F.R.S., 75
Hartog (Prof. Marcus M.), Achlya, 298

Hartog (P. J.), a First Foreshadowing of the Periodic Law, 186 Harvard College, the Astronomical Observatory of, 446

Harvey (Augustus), Influenza, 270 Hauck (Dr. F.), Death of, 256 Hawes (F. B.), Carbon Deposit in Blake Telephone Trans-

mitter, 477
Haycraft (Dr. J. B.), Voluntary Muscular Contraction, 495
Haze, the Causes and Character of, Hon. F. A. R. Russell, 60
Hazen (Prof. H. A.), Use of "Sling" Thermometer in Prediction of Frosts, 501
Head-hunters, a Naturalist among the, C. W. Woodford, 582
Health, Hygiene or Public, Louis C. Parkes, 290

Heat, Animal, M. Berthelot, 119
Heat and Light, Rev. F. W. Aveling, 558
Heavens, Scenery of the, J. E. Gore, 391
Hebert (M.), Funeral of, 545
Heilprin (Angelo), a Contribution to the Physical History and Zoology of the Somers Archipelago, with an Examination of the Structure of the Coral Reefs, Dr. H. B. Guppy, 193 Helmholtz (Prof.), on the Production of Waves, 95

Helsingfors University, 400
Hempel (Dr.), Experiments upon Simultaneous Production of
Pure Crystals of Sodium Carbonate and Chlorine from Common Salt 16

Hemsley (W. Botting, F.R.S.): Scientific Papers of Dr. Asa Gray, 221; Flora of Keeling Islands, 492; Self-Colonization of Coco-Nut Palm, 537 Henry (Louis), Glycollic Nitrile and direct Synthesis of Glycollic

Acid, 576 Henry (Paul and Prosper), Suppression of Halos in Photographic

Plates, 576 Hepperger (J. Van), Velocity of the Propagation of Gravitation,

erdman (Prof. W. A.): Les Animaux et les Végétaux Lumineux, Henri Gadeau de Kerville, 293; Foreign Sub-Herdman (Prof. W.

Lumneux, Henri Gadeau de Kerville, 293; Foreign Substances attached to Crabs, 344

Heredity and Effects of Use and Disuse, F. H. Collins, 559

Heredity, Theory of, Prof. A. Weismann, 317, 373, 439

Hermite (Prof. Ch.), Mathematical Teaching at Sorbonne, 597

Herring, the Zuyder Zee, Dr. Hoek, 216

Herschel (Prof. A. S., F.R.S.): a Natural Evidence of High

Thermal Conductivity in Flints, 175; the Spectrum of Sub-

chloride of Copper, 513 ertz's Vibrator, Wimshurst Machine and, T. A. Garrett and Hertz's Vibrator. W. Lucas, 515

W. Lucas, 515
Hertz's Vibrators, Multiple Resonance obtained in, Prof. Geo.
Fras. Fitzgerald, 295; Fred T. Trouton, 295
Herzegovina, Earthquakes in, 136
Hess (Carl), the Eye of the Mole, 373
Heymans (Dr.), Myelin, 528
Hicks (W. M., F.R.S.), Elementary Dynamics of Particles and

Solids, 534

Hickson (Sydney J.), a Naturalist in North Celebes, Dr. F. H.

H. Guillemard, 457

High Latitudes, Sun-spot in, G. Dierckx, 472

Hilger (Dr.), Taxine, a New Alkaloid from Yew Leaves, &c.,

496
Hill (J. Rutherford), the Meteorite of Migheï, 298
Hill (S. A.), Hailstorms in Northern India, 236
Himalayas, Glaciation of Valleys in Kashmir, Captain Stiffe,

Hind (Dr. W. M.,), the Flora of Suffolk, 149 Hind (Dr. Wheelton), on the Geology of Suffolk, 149 Hiorns (Arthur H.), Iron and Steel Manufacture, 159 Hirn (Gustave Adolphe): Death of, 281; the Life and Work

of, Prof. A. G. Greenhill, F. R. S., 323
Hissar, Illustrations of some of the Grasses of the Southern
Punjab, being Photographs of some of the Principal Grasses
found at, William Coldstream, 533
History of Modern Philosophy, Descartes and his School, Prof.

Kuno Fisher, 171 Holden (Prof.), Total Eclipse of January 1, 1889, 305

Hollis (W. Ainslie), Galls, 131, 274 Holmgren (Prof.), Cause of Change of Skin-colour in Arctic

Voyagers, 546
Holt (Ernest W. L.): Foreign Substances attached to Crabs, Holt (Ernest W. L.): Foreign Substances attached to Crabs, 463, 515, 586; some Stages in Development of Brain of Clupea havengus, 525
Hopkins (George M.), Experimental Science, 102
Hopkins (W. B.), Behaviour of more Stable Oxides at High Temperatures, 502
Hopkinson (Dr. J., F.R.S.): Magnetism, 249, 273; Physical Properties of Nickel Steel, 332
Horny Sponges, Robert von Lendenfeld, 146
Horses, Fossil, of Argentina, Dr. Hermann Burmeister, 82
Horsley (Victor, F.R.S.), Arrangement of Excitable Fibres of Internal Capsules of Bonnet Monkey. 166

Internal Capsules of Bonnet Monkey, 166 Horticultural Exhibition, the Proposed Berlin International, 283 Horticulture, the Cultivated Oranges and Lemons of India and Ceylon, Dr. E. Bonavia, C. B. Clarke, F.R.S., 579 Hough (Walter), Archæology and Ethnology of Easter Island,

569

Houssay (F.), Les Industries des Animaux, 409

Houssay (F.), Les Industries des Animaux, 409 Houston (Prof. E. J.), Remarkable Hailstones at Philadelphia, 43 Houzeau (J. C.): Biographical Note on, A. Lancaster, 20, 69; Vade Mecum, 69 Hudson (Dr. C. T., F.R.S.), on some Needless Difficulties in

Vade Mecum, 69
Hudson (Dr. C. T., F.R.S.), on some Needless Difficulties in the Study of Natural History, 375
Hudson (W. H.), Argentine Ornithology, R. Bowdler Sharpe, 7
Hues's (Robert), Treatise on the Globes (1592), 459
Hughes (Mrs. Watts), Voice Figures, 42
Hulme (F. Edward), Wayside Sketches, 270
Human Anatomy, a Text-book of, Prof. Alex. Macalister,

F.R.S., 269

Human Foot, the, Thos. S. Ellis, 365

Hume (Allan O.), the Nests and Eggs of Indian Birds, Vol. I.,

Humphry (Geo. M., M.D., F.R.S.), Old Age, 484 Hyderabad Chloroform Commission, 154, 289

Hydra, New Variable Star in, 88

Hydraulic Motors, Turbines and Pressure Engines, G. R. Bodmer. 27

Hydrazine, Drs. Curtius and Jay, 547 Hydrobromic Acid, the Preparation of, A. Recoura, 599

Hydrophobia, the New Muzzling Regulation, 241
Hydrostatics, Stability of Rotating Spheroid of Perfect Liquid,
E. H. Bryan, 526
Hydroxylamine with Metallic Chlorides, New Compounds of,

Hydroxylamine with Metallic Chlorides, New C. Crismer, 401
Hygiene and Demography, Congress on, 401
Hygiene of French Native Colonists in Paris, 427
Hygiene or Public Health, Louis C. Parkes, 290
Hypnotic Subjects and the Eye, 94
Hypothesis, Nebular, Herbert Spencer, 450

Iapetus, Observations of the Magnitude of, 403 Ice Forms, Peculiar, Prof. J. G. MacGregor, 463 Iceland: Diminution in Population of, 473; M. Thoroddsen's

Explorations in, 165
Ichthyology: the Spiracle Gill of Selachians, Dr. Virchow, 119; the Zuyder Zee Herring, Dr. Hoek, 216; Anchovies on South Coast of England, J. T. Cunningham, 230; Drumming Fish (Balistes aculeatus), 263; Anatomy of Torpedo marmorata, Prof. Fritsch, 264; Sardines in Moray Firth, Prof. Ewart, 282; the Bladder in Fishes, Prof. Liebreich, 359; Cranial Nerves of Torpedo, Dr. J. C. Ewart, 477; Marine Fisheries Society of Great Grimsby, 520; some Stages in Development of Brain of Clustea havengus, E. W. L. Holt, 525
Identity of Comet Vico (1844) with Brooks's (1889), 233
Idylls of the Field, Francis A. Knight, 79
Im Hochgebirge, Wanderungen von Dr. Emil Zsigmondy, 291
Images, Visualized, Produced by Music, Geo. E. Newton, 417
Index of British Plants, Robert Turnbull, 196
Index Generum Avium, F. H. Waterhouse, R. Bowdler Sharpe, 169 Explorations in, 165

Sharpe, 169
Index: a Suggested Subject-index to the Royal Society's Catalogue of Scientific Papers, 342, 391
Index of the Papers of the London Mathematical Society, 594
Index of the Papers of the London Service Examinations, 25, Index of the Papers of the London Mathematical Society, 594
India: Science and the Indian Civil Service Examinations, 25,
265; Henry Palin Gurney, 53; Indian Geological Survey,
Death of Mr. E. J. Jones, 41; Recent Indian Surveys, 139,
230; Fauna of British India, including Ceylon and Burma, 101;
Wanton Destruction of Forests in India, R. J. Crosthwaite,
210; Dr. Schlich, 470; Northern, Hailstorms in India, S. A.
Hill, 236; Olive Cultivation in India, 303; Travels in India,
Jean Baptiste Tavernier, 313; the Birds of India, E. W.
Oates, 388; the Nests and Eggs of Indian Birds, Allan
O. Hume, 388; Locusts in India, E. C. Cotes, 403, 491;
Technical Education in Central, 470; Suggestion for Facilitating the Study of Botany in, G. Carstensen, 546; Provincial
Index of Minerals of, Dr. W. King, 546; Native Indian
Scientific Literature, 569; the Cultivated Oranges and Lemons
of India and Ceylon, Dr. E. Bonavia and C. B. Clarke, F. R. S.,
579; Catalogue of the Library of Indian Museum, 594

of India and Ceylon, Dr. E. Bonavia and C. B. Clarke, F. R. S., 579; Catalogue of the Library of Indian Museum, 594
Indian, American, Languages, Use of Edison Phonograph in Preserving, J. W. Fewkes, 560
Indian, American, Pipe, H. B. Bashore, 303
Indigo, New Method of Synthesizing, Dr. Flimm, 326
Inductive Capacity, Specific: W. A. Rudge, 10; Prof. Oliver J. Lodge, F. R. S., 30

J. Lodge, r. R. S., 30
Influenza: the Epidemic of, 145; W. Greatheed, 270; Augustus Harvey, 270; the Suspected Connection between Influenza and Cholera Epidemics, Dr. Smolenski, 282; Climatological Considerations about Influenza, Dr. Assmann, 325; Children's Growth in Weight checked by Influenza, 471; Supposed Chinese Source of Russian Influenza, 593; Influenza and Weather, Mitchell and Busham, 106

Weather, Mitchell and Buchan, 596 Weather, Mitchell and Buchan, 596
Inheritance of Acquired Characters: the Duke of Argyll, F.R.S.,
173, 294, 366; W. T. Thiselton Dyer, F.R.S., 315; F. V.
Dickins, 316; Right Rev. Bishop R. Courtenay, 367; Dr. J.
Cowper, 368; Herbert Spencer, 414; Prof. E. Ray Lankester,
F.R.S., 445. See also Panmixia
Inheritance of Acquired Mental Peculiarity, Handtmann, 209
Inherited Characters and Panmixia, Prof. Geo. J. Romanes,
F.R.S. 427

F.R.S., 437

Insect, Note on a Probable Nervous Affection observed in an, E. W. Carlier, 197 Institution of Civil Engineers, 229 Institution of Electrical Engineers, 21

Institution of Mechanical Engineers, 331; Anniversary Meeting,

Institution of Naval Architects, 494, 515 Internationales Archiv für Ethnographie, 209, 372 Iron and Steel Institute, Visit to America of, 469

Iron and Steel Manufacture, Arthur H. Hiorns, 150 Iron and Steel, Molecular Stability of Metals, particularly of,

Carl Barus, 369
Iron, the Relation between Atomic Volumes of Elements present in, and their Influence on its Molecular Structure, Prof. W. C. Roberts-Austen, F. R. S., 420
Iron, the Villari Critical Points in Nickel and, Herbert

Tomlinson, F.R.S., 574

Irving (Rev. A.), Chemical and Physical Studies in the Metamorphism of Rocks, 49
Isefiord, Denmark, Zoological Floating Station at, 569
Italy, Southern, Geological Excursion to the Active and Extinct

olcanoes of, 133

Italy: Earthquake in, 136; Activity of Queccia de Salsa, 181 Ivy, Abnormal Shoots of, W. F. R. Weldon, 464 Izvestia of the Russian Geographical Society, 352

Jackson (W. E.), Nebula, General Catalogue No. 4795, 450
 Jacobi (Mary Putnam), Physiological Notes on Primary Education and the Study of Language, 28
 James (Dr. Bushrod W.), American Resorts, with Notes upon

James (Dr. Bushrod W.), American Resorts, with Notes upon their Climate, 79

James (W. J.), the Use of the Word Antiparallel, 10

Jamieson (Prof.), Magnetism and Electricity, 461

January, Weather in, Chas. Harding, 425

Japan: Cyclone of September 11-12, 1889, in, M. Wada, 208;

Great Volcanic Eruption in, 400; Meteorology in 1887,

M. Wada, 400; Japanese Dwarf Tree (Thuja obtusa), 86

Japp (Prof. F. R., F.R., S.): a-B-Dibenzoylstyrolene and Zinin's

Lavidan Derivatives 142; Compounds of Phenanthraguinone

Lepiden Derivatives, 142; Compounds of Phenanthraquinone with Metallic Salts, 191

Jastrow (Prof.), the Cradle of the Semites, 569 Java Sea, Coral Reefs of the, and its Vicinity, Dr. H. B.

Guppy, 300
Jay (Dr.), Hydrazine, 547
Jenkins (Prof. P.), the Strength of Ships, 515
Jerusalem, Troglodytic Remains in, Herr Schick, 284
Jesse (O.), Photographs of Luminous Night Clouds, 592

Jesse (O.), Photographs of Luminous Night Clouds, 592
Johns Hopkins University, 448
Johnson (W. E.), Proof of the Parallelogram of Forces, 153
Johnson (Prof. W. W.), a Treatise on Ordinary and Partial
Differential Equations, 270
Johnston (Miss E. J.), the Relation of Physiological Action to
Atomic Weight, 189
Johnston (R. M.), Variability of Tasmanian Unio, 303
Joly (A.), Double Nitrites of Ruthenium and Potassium, 23
Joly (A.), the Steam Calorimeter, 212: Resonance Method of

Johy (J.): the Steam Calorimeter, 212; Resonance Method of Measuring Constants of Gravitation, 256

Jones (E. J.), Death of, 41

Jones (W.), Glimpses of Animal Life, 409

Jörgensen (Alfred), the Micro-organisms of Fermentation practically considered, Prof. Percy F. Frankland, 339

Joule (Prof. J. P.), Proposed Memorial to, 89, 160, 281

Journal of Botany, 405

Jukes-Browne (A. J.): Physics of the Sub-oceanic Crust, 53;

Is the Bulk of Ocean Water a Fixed Quantity?, 130

Jungfrau Railway, Proposed, Herr Trautweiler, 303 Jupiter, Recent Observations of, W. F. Denning, 206 Jupiter's Belt 3, III., the Structure of, Dr. Terby, 45 Jupiter's Satellites, Ch. André, 94

Kane (Sir Robert, F.R.S.): Death of, 371; Obituary Notice

Kangaroos, Decrease of, 43
Karlsruhe Observatory, A. Fowler, 20
Kater Pendulum, Shuckburgh Scale, O. H. Tittmann, 538
Kater Pendulum, Shuckburgh Scale, O. H. Tittmann, 538 Katzenstein (Dr.), Experiments on Influence of Bodily Labour

on Metabolism of Man, 479
Kaulbars (Baron), Geography in Russia, 208
Keeling Islands, Flora of, Dr. H. B. Guppy, W. B. Hemsley,
F.R.S., 492

Keiser (Dr. E. H.), Redetermination of Atomic Weight of Palladium, 44

Kent, Discovery of Coal in, 400

Kerville (Henri Gadeau de), Les Animaux et les Végétaux Lumineux, Prof. W. A. Herdman, 293

Kew Bulletin, 42, 136, 283, 325, 448, 569 Kew Observatory Report, 208 Key to the Royal Society Catalogue, James C. McConnel, 342,

391, 418 Khűrbet 'Ajlân, Excavations at, 592 Kiel, the Botanical Institute and Marine Station at, 397 Kiev, Actinometric Observations (1888–89) at, R. Savelief, 359 Kilima-Njaro, the Ascent of, Dr. Hans Meyer and Purtscheller,

Kilima-Njaro, the Ascent of, Dr. Halls Ascential 164, 572
King Charles Land, Prof. Kuekenthal's Researches in, 234
King (Dr. George, F.R.S.), Materials for a Flora of the Malayan Peninsula, 437
King (Dr. W.), Provincial Index of Minerals of India, 546
Kirby (W. F.), Systems of "Russian Transliteration," 534
Kirschbaum (Madame Rosa), First Lady Physician admitted to Medical Practice in Austria, 509
Klein (Dr. E., F.R.S.), the Bacteria of Asiatic Cholera, 509
Klingemann (Dr. F.), g-B-Dibenzoyltyrolene and Zinin's Lepiden

Klingemann (Dr. F.), a-\(\beta\)-Dibenzoyltyrolene and Zinin's Lepiden Derivatives, 142

Knight (Francis A.), Idylls of the Field, 79 Knopf (Dr.), Comet Brooks (d 1889, July 6), 115 Knott (Prof. Cargill G.), the Earthquake of Tokio, April 18, 1889, 32 Kny (Herr), on Trees Growing in an Inverted Position, 86

Kolaba District, Flint Remains in, W. E. Sinclair, 114 Kossel (Prof.), Microscope as applied to Physiological Chemis-

try, 23 Krakatao, the Period of the Long Sea-waves of, James C. McConnel, 392

Kremser (Dr.), Frequency of Mist, 215 Kubary (J. S.), Ethnographische Beiträge zur Kenntniss des Karolinen Archipels, 433 Küchenmeister (Dr. Gottlob Friederich H.), Death of, 59

Kuekenthal's (Prof.), Researches in King Charles Land, 234

Kunz (G. F.), Mexican Amber, 372 Kutter (W. R.) and E. Ganguillet, a General Formula for the Uniform Flow of Water in Rivers and other Channels, 411

Laboratories of Bedford College, London, 279 Laboratory, Botanical, in the Royal Gardens, Peradeniya,

Ceylon, 445
Laboratory, New Marine, at St.-Wast-la-Hougue, 160

Laboratory, the Poona Bacteriological, 469 Laboratory Work, Elements of, A. G. Earl, 461 Labuan, the African Oil Palm in, 42

Laccadive Islands, Rat-plague in, 303 Ladybird, Australian, in California, Spread of the, J. R. Dobbins, 161

Lagrange (Dr. Fernand), Physiology of Bodily Exercise, 485 Lake-dwelling near Milan, Discovery of, 67

Lalang, Noxious Grass at Singapore, 182
Lamarck versus Weismann, Prof. E. D. Cope, 79
Lamarck's and Darwin's Theories as to Transmission of Acquired Characters, Prof. E. R. Lankester, F.R.S., 486
Lamb (Prof. Horace, F.R.S.); on a Certain Theory of Elastic

After-strain, 463; on the Deformation of an Elastic Shell, 549 Lamp (Dr. E.): Return of Brorsen's Comet, 69; Comet Swift

(f 1889, November 17), 233 (f 1889, November 17), 233
Lampert (Dr.), Zoogeography, Wolves, &c., in Germany, 182
Lamplugh (G. W.), the Wanton Destruction of Sea-birds, 490
Lancaster (M. A.), Biographical Note on, J. C. Houzeau, 20
Land, Area of the, and Depths of the Oceans in Former Periods,
T. Mellard Reade, 103
Langley (E. M.), the Use of the Word Antiparallel, 104
Langley (J. N., F.R. S.), Local Paralysis of Peripheral Ganglia
and Connection of Nerve-Fibres with them, 118

Langley (J. N., F.K.S.), Local Paralysis of Peripheral Ganglia and Connection of Nerve-Fibres with them, 118

Langley (Prof.), the Solar and the Lunar Spectrum, 450

Language, Study of Physiological Notes on Primary Education and the, Mary Putnam Jacobi, 28

Languages, American Indian, Use of Edison Phonograph in

Languages, American Indian, Use of Edison Frionograph in Preserving, J. W. Fewkes, 560
Lankester (Prof. E. Ray, F.R.S.): Darwinism, 9; E. D. Cope on the Causes of Variation, 128; the Inheritance of Acquired Characters, 415; Transmission of Acquired Characters and Panmixia, 486; Panmixia, 558

Lapouge (M. de), Modern Crania in Montpellier, 357 Larden (W.), Mirage in the South American Pampas, 69 Lascelles (B. P.) and R. P. Williams, Introduction to Chemical

Science, 128

Latitude, Redetermination of, in Tokio, Watanabe, 427

Latter (Prof. Oswald H.), Who Discovered the Teeth in Ornithorhynchus?, 130, 174

Law, Science and, 399 Lawes (Sir J. B., F.R.S.), a Field laid down to Permanent Grass, 229 Lea (A. S.), a Comparative Study of Natural and Artificial

Digestions, 430 Leak-stopping in Steel Ships, Captain C. C. P. Fitzgerald,

R.N., 516 Lean (Wm. Scarnell), a Brilliant Meteor, 60 Leaper (Clement J.), Synoptical Tables of Organic and Inorganic Chemistry, 510

Least Squares, Theory of, a Formula in the, D. Wetterhan, 394 Lebeau (P.): Volumetric Estimation of Copper, 431; Estimation of Free Halogen and Iodides in Presence of Chlorine and

Bromine, 479
Le Conte, Formation of the Earth's Crust, 46
Lefroy (Sir John H., F.R.S.), Death and Obituary Notice of, 568

Lehmann (Dr.): the Babylonian Metrical System, 167; the Testing of Tuning-forks, 383
Leicester Museum Grounds, on a Mite of the Genus Tetranychus

found Infesting Lime Trees in the, F. R. Rowley, 31 Leicestershire and Rutland, the Vertebrate Animals of, Montagu

Browne, 220
Lendenfeld (Dr. Robert von): a Monograph of the Horny Sponges, 146; Physiology of Sponges, 570; Foreign Substances attached to Crabs, 317
Lepidoptera, Sugar losing its Attractions for, Joseph Anderson,

349 Lepidoptera, Temperature Experiments on, F. Merrifield, 191

Lesquereux (Prof.), Death of, 135 Lesser Antilles, the, Owen T. Bulkeley, 268 Leumann (Prof.), Influence of Blood-Circulation and Breathing

on Mind-Life, 209
Leveau (G.), D'Arrest's Comet, 596
Lewes (Prof. V.), the Ignition of Coal Cargoes, 517
Lewis (Prof. H. C.), the late, Wm. Upham, 256
Ley (Rev. W. Clement): Thought and Breathing, 317; Chiff-Choff, bright of Santagaber, 277

Chaff singing in September, 317 Leyden Ethnographical Collection, the, 180 Libraries, Free, the Manchester, 181

Libraries, Free, the Manchester, 181
Library, Bethnal Green Free, Proposed Enlargement of, 349
Library, Proposed Free, at Whitechapel, 161
Library Reference Atlas of the World, John Bartholomew, 413
Liebreich (Prof.), the Bladder in Fishes, 359
Life, Animal, Glimpses of, W. Jones, 409
Light, Coronal, Photometric Intensity of, Prof. Thorpe, 139
Light and Heat, Rev. F. W. Aveling, 558
Light, New, from Solar Eclipses, William M. Page, William
E. Plummer, 529
Light Ayes. Measurement by, A. A. Michelson, 405

E. Plummer, 529
Light-Waves, Measurement by, A. A. Michelson, 405
Lightning, Effects of, 10
Lightning, Globular and other Forms of, Reuben Phillips, 58
Like to Like, a Fundamental Principle in Bionomics, Prof. Geo.
J. Romanes, F.R.S., 535; John T. Gulick, 535
Lime, Crystals of, H. A. Miers, 515, 560
Lime Trees in Leicester Museum Grounds, on a Mite of the
Genus Tetranychus found Infesting, F. R. Rowley, 31
Linear Differential Equations, a Treatise on, Thomas Craig,

Linear Differential Equations, a Treatise on, Thomas Craig, 508

Ling (A. R.), Studies on Isomeric Change, IV., Halogen Derivatives of Quinone, 527

Linnean Society, 143, 191, 239, 334, 405, 431, 478, 527, 599 Linnean Society of New South Wales, 161, 284 Linossier (G.), Morphology and Biology of *Oidium albicans*, 72 Liquid Surfaces, Tension of Recently-formed, Lord Rayleigh,

566

Liquids, Determination, by Measurement of Ripples, of Surface Tensions of, Prof. C. Michie Smith, 575 Lissa (Baron de), the Pioneer Plants of British North Borneo,

494 Liverpool Literary and Philosophical Society, 471

Liverpool Physical Society, 135 Lizard of South-West United States, Heloderma suspectum, the Poisonous, Craniology of, R. W. Shufeldt, 181

Lobley (J. Logan), Mount Vesuvius, 195 Lockyer (J. Norman, F.R.S.): the Physical and Chemical Characteristics of Meteorites as throwing Light upon their

Past History, 305; on the Zodiacal Light, 402 Locomotive, the Latest Express Compound, 448

Locusts in India, E. C. Cotes, 403, 491 Locusts in the Red Sea, G. T. Carruthers, 153 Lodge (Prof. Dr. Oliver J., F. R. S.): Modern Views of Electricity,

5, 80; Specific Inductive Capacity, 30; the Peltier Effect and Contact E. M. F., 224; Easy Lecture Experiment in Electric Resonance, 368; Electrical Radiation from Conducting Spheres, an Electric Eye and a Suggestion regarding Vision,

Loewig (Dr. K. J.), Death of, 545

Logical Machine, a New, Mary Boole, 79 London Geological Field Class, 519

London Mathematical Society, 594 London, the Moon in, Rev. T. R. R. Stebbing, 586 London Polytechnic, a South, 481

London, Polytechnics for, 242 London University, the Proposed Reconstitution of, 282, 348 Longitude of Mount Hamilton, 211 Longitude between Paris and Leyden, Difference of, Bassot,

Longitudes, Annuaire du Bureau des, 327

Looghou Islands, Proposed Meteorological Observatory in, 401 Loomis on Rainfall of Earth, Dr. van Bebber, 43 Lott (Francis Edw.) and Chas. Geo. Mathews, the Microscope

in the Brewery and Malt-house, 246

Lovell (I.', Solar Halos and Parhelia, 560 Lowe (E. J., F.R.S.), the Chaffinch, 394 Lucas (W.) and T. A. Garrett, Wimshurst Machine and Hertz's Vibrator, 515 Ludwigshafen, Antediluvian Remains Discovered at, 520 Lumbelt (Carl)

Lumholtz (Carl), Among Cannibals, 200 Luminous Clouds: T. W. Backhouse, 297; Joseph John

Murphy, 298 Luminous Night Clouds, Evan McLennan, 131 Luminous Organisms, Henri Gadeau de Kerville, Prof. W. A.

Herdman, 293

Lummer (Dr.), Abbe's Apparatus for Testing Transparent Films with Plane Parallel Surfaces, 552 Lunar Craters, Changes in, Prof. Thury, 183 Lund Museum in the University of Copenhagen, 26

Lunge (Prof.), Improved Apparatus for Gas Measurements, 471

Lupton (Sydney), the St. Petersburg Problem, 165 Lussana (S.), the Absorption of Hydrogen by Iron, 380 Lydekker (Richard), Catalogue of the Fossil Reptilia and

Amphibia in the British Museum (Natural History), 534 Lynn (W. T.), Obituary Notice of Lorenzo Respighi, 254

Macalister (Prof. Alex., F.R.S.), a Text-book of Human Anatomy, 269 M'Alpine (A. N.), How to know Grasses by their Leaves, Prof.

John Wrightson, 557

McConnel (James C.): the Period of the Long Sea-Waves of Krakatao, 392; Key to the Royal Society Catalogue, 342,

391, 410 McGrath (Joseph), the Arc Light, 154 MacGregor (Prof. J. G.), Peculiar Ice Forms, 463 McGregor (Sir W.), Explorations in New Guinea, 374 McIntosh (Prof. W. C., F.R.S.), the Administration of Foreign

Fisheries, 497
McLachlan (R., F.R.S.), Galls, 131
McLennan (Evan), Luminous Night Clouds, 131
Macmahon (Major P. A., R.A.): a New Theory of Symmetric Functions, II., 71; Symmetrical Functions of Roots of

Functions, 11., 71; Symmetrical Functions of Roots of Systems of Equations, 380

McNab (Dr. William Ramsay): Death of, 112; Obituary Notice of, 159; Proposed Memorial to, 347

Madagascar, Astronomical Observatory at, 497

Magnetic Observatory, Potsdam, Dr. Eschenhagen, 479

Magnetic Surveys of Special Districts in the British Isles, Profs.

A. W. Britcher, F. P. S. and T. E. Thorne, F. R. S. 508

Magnetic Surveys of Special Districts in the British Isles, Profs. A. W. Rücker, F.R.S., and T. E. Thorpe, F.R.S., 598 Magnetical Results of the Voyage of H.M.S. Challenger, Report on the, Commander E. W. Creak, F.R.S., 105, 363, Magnetism in Brick Buildings, R. W. Willson, 405 Magnetism, Dr. J. Hopkinson, F.R.S., 249, 273 Magnetism and Electricity, Arthur W. Poyser, 52 Magnetism and Electricity, Prof. Andrew Jamieson, 30, 461

Magnetism, a Proposed Gilbert Club, 84 Magnetization of Cobalt, Effects of Pressure on, C. Chree, 237 Maiden (J. H.), the Useful Plants of Australia, 194

Malaga, Earthquake at, 470 Malay Peoples, the, Dr. B. Hagen, 21 Malayan Peninsula, Materials for a Flora of the, Dr. Geo. King, F.R.S., 437

Malic Acid and its Compounds, D. Gernez, 94 Maltese Butterflies, George Fraser, 199 Mammalian Molars, Primitive Types of, 465 Mammoth Skeleton in Russia, Discovery of, 448

Manchester Conference on the Technical Instruction Act, 97 Manchester Field Naturalists' Society, 593

Manchester Free Libraries, the, 181 Manchester Literary and Philosophical Society, 373; Annual

Manchester Literary and Philosophical Society, 373; Anni Report of, 137
Manchester, Proposed Planting of Evergreen Shrubs in, 401
Manchester, Street Plants in, 42
Manganese, New Mode of Preparing, Dr. Glatzel, 67
Manures, Stable, the Fermentation of, Th. Schlossing, 143
Manures and their Uses, Dr. A. B. Griffiths, 222, 272

Manuscripts, Ancient Cingalese, 349 Manx Geological Society, 208

Maori Cave-dwelling, Discovery of, H. O. Forbes, 209
Maps: Facsimile Atlas to the Early History of Cartography,
A. E. Nordenskiöld, 558

Maquenne (M.), 8-Inosite, 215
Marcet (Dr.), Atmospheric Dust, 358, 473
Marchand (Em.), Observations on Sun-spots made at Lyons Observatory in 1889, 599
Marine Fisheries Society of Great Grimsby, 520

Marine Laboratory, New, at St.-Wast-la-Hougue, 160 Marine Millipede, a, 104; Edward Parfitt, 153; R. I. Pocock,

Marine Phenomenon at Batoum, Curious, 426

Marine Station at Kiel, 397

Marine Survey of India, 140 Markham (Clements R., F.R.S.), a Life of John Davis, 52

Marlborough College Natural History Society, 545 Marriott (William), Royal Meteorological Society's Exhibition,

Mascart (M.), Relation of certain Magnetic Perturbations to

Mascart (M. J., Relation of Certain Augustian Carthquakes, 23
Mascart (M. E.), Traité d'Optique, J. D. Everett, 224
Mass of Saturn, Asaph Hall, 429
Massaja (Cardinal G.), Death and Obituary Notice of, 164
Masson (Prof. Orme), Australasian Association for the Advance-

ment of Science, 441 Matabele Land and the Victoria Falls, Frank Oates, R. Bowdler

Sharpe, 169 Sharpe, 169
Mathematics: Calcul des Probabilités, J. Bertrand, 6; the Method of Quarter Squares, J. W. L. Glaisher, F.R.S., 9; the Use of the Word Antiparallel, W. J. James, 10; a Physical Basis for the Theory of Errors, C. V. Burton, 47; a New Theory of Symmetric Functions (IL), Major MacMahon, 71; a New Logical Machine, Mary Boole, 79; Geometrical Teaching, 80; Mathematical Society, 94, 214, 287, 503, 575, 594; W. E. Johnson on the Proof of the Parallelogram of Forces, 152; the St. Petersburg Problem Sydney Lupton. 594; W. E. Johnson on the Proof of the Parallelogram of Forces, 153; the St. Petersburg Problem, Sydney Lupton, 165; Glissette of Hyperbola, Prof. Tait, 214; the Extension and Flexure of Cylindrical and Spherical Thin Elastic Shells, A. B. Basset, F.R.S., 238; a Treatise on Ordinary and Partial Differential Equations, Prof. W. W. Johnson, 270; the Parallelogram of Forces, Prof. A. G. Greenhill, F.R.S., 298; Roots of an Algebraic Equation, Prof. A. Cayley, F.R.S., 335, 359; B. A. Muirhead on Ten and Tenth Notation, 344; Determination of Regulated Harmonic Surfaces, L. Raffy, 359; Symmetrical Functions of Roots of Systems of Equations, Maior P. A. MacMahon, R. A., 280; Unit of Equations, Maior P. A. MacMahon, R. A., 280; Unit of L. Kany, 359; Symmetrical Functions of Roots of Systems of Equations, Major P. A. MacMahon, R.A., 380; Unit of Length of Sir G. Shuckburgh's Standard Scale, General J. T. Walker, R.E., F.R.S., 381; the Exponential Function, Stieltjes, 382; a Formula in the Theory of Least Squares, D. Wetterhan, 394; Newton in Perspective, Robert H. Graham, 439; the Elastical Researches of Barré de Saint-Vannat, Prof. A. G. Greenbill, F.R.S. 458; on a Certain Graham, 439; the Elastical Researches of Barré de Saint-Venant, Prof. A. G. Greenbill, F.R.S., 458; on a Certain Theory of Elastic After-Strain, Prof. Horace Lamb, F.R.S., 463; Oxford "Pass" Geometry, 467; a Treatise on Linear Differential Equations, Thos. Craig, 508; Four-Figure Mathematical Tables, J. T. Bottomley, F.R.S., 510; Equa-tions aux derivées partielles de la Physique Mathématique, Poincaré, 525; the Shuckburgh Scale and Kater Pendulum,

O. H. Tittmann, 538; Deformation of an Elastic Shell, Prof. Horace Lamb, F.R.S., 549; Index of the Papers of the London Mathematical Society, 594; Mathematical Teaching

London Mathematical Society, 594; Mathematical Teaching at Sorbonne, Prof. Ch. Hermite, 597
Mather (T.): Galvanometers, 310, 381; Shape of Movable Coils used in Electrical Measuring Instruments, 574
Mathews (Chas. Geo.) and Francis Edw. Lott, the Microscope in the Brewery and Malt-house, 246

Maximum Light-Intensity of the Solar Spectrum, Dr. Mengarini,

374
Mechanical Engineers, Institution of, 331
Mechanics, the Behaviour of Twisted Strips, Prof. J. Perry,

F.R.S., 47
Mechanics, Parallel Motion suitable for Recording Instruments, A. P. Trotter, 478

Mediterranean Sea, Greatest Depths in, 86

Méguéia Meteorite, the, Prof. Simaschko, 472 Melbourne Observatory: Transit Observations at, 351; Star

Catalogue, 522

Melbourne, the Ballarat School of Mines, Melicerta ringens, Dr. C. T. Hudson, F.R.S., on, 377 Melde's Vibrating Strings, Rev. W. Sidgreaves, 355 Meldola (R., F.R.S.), the Chemistry of Photography, 293 Mengarini (Dr.), Maximum Light-Intensity of the

Spectrum, 374 Merchant Service, Colour-Blindness in the, 494 Mercury, on the Rotation of, Signor Schiaparelli, 257 Mercury in vacuo, Apparatus for Distilling, Prof. Dunstan, 526

Mergui and its Archipelago, Fauna of, 556

Meriam (Dr.), Pheasant Culture on Pacific Coast, 137 Merriam (Dr. C. Hart): Who discovered the Teeth in the Ornithorhynchus?, 11; Prof. W. H. Flower, F.R.S., 151 Merrifield (F.), Temperature Experiments on Lepidoptera,

Mersey Estuary, Effects of Training Walls in, L. F. V. Harcourt, 380
Meslans (M.), Isolation of Fluoroform, 521

Mestalic Prominence, Spectrum of a, 233
Metallurgy: on the Hardening and Tempering of Steel, Prof.
W. C. Roberts-Austen, F.R.S., 11, 32; Iron and Steel
Manufacture, by Arthur H. Hiorns, 150; Physical Properties
of Nickel Steel, Dr. J. Hopkinson, F.R.S., 332; the Rupture
of Steel by Longitudinal Stress, C. A. Carus-Wilson, 574;
the Villari Critical Point in Nickel and Iron, Herbert Tomlinson, F.R.S., 574; International Exhibition of Metallurgy and Mining at the Crystal Palace, 592 Metals: Molecular Stability of, particularly of Iron and Steel, Carl Barus, 369; Relation between Electric and Thermal

Conductivities of, Alph. Berget, 387 Metamorphism of Rocks, Chemical and Physical Studies in the,

Metamorphism of Rocks, Chemical and Physical Studies in the, Rev. A. Irving, 49
Meteorology: Electrical Cloud Phenomena, Prof. W. K. Burton, 10; Quarterly Weather Report for 1880, 18; Loomis on the Rainfall of the Earth, Dr. van Bebber, 43; Remarkable Hailstones at Philadelphia, Prof. E. J. Houston, 43; the Causes and Character of Haze, Hon. F. A. R. Russell, 60; Dr. Bushrod W. James's American Resorts, with Notes on their Climate, 79; Proposed Meteorological Station at the Bermuda Islands, 85; Annual Report of the Deutsche Seewarte, 85; Berlin Meteorological Society, 96; Deutsche Seewarte Observations, 231; Pilot Chart of the North Atlantic Ocean, 85, 161, 401; Rainfall of Germany during 1876–85, Dr. H. Meyer, 85; American Meteorological Journal, 92; Thunderstorms in England and Wales, 93; Prof. von Bezold on the Production of Clouds, 95; Meteorological Society, see Royal; Meteorology of New South Wales, H. C. Russell, 113; Meteorology of the Straits Settlements, 114; a Popular Treatise Meteorology of the Straits Settlements, 114; a Popular Treatise on the Winds, William Ferrel, 124; Luminous Night Clouds, Evan McLennan, 131; Meteorology of Suffolk, 149; Barometric Gradients, Teisserenc de Bort, 161; the Observa-Barometric Gradients, Teisserenc de Bort, 161; the Observations of Temperature on top of Eiffel Tower, Alfred Angot, 167, 181; Meteorological Institute of Roumania, 181; Cyclone of September 11–12, 1889, in Japan, M. Wada, 208; Meteorological Institute of the Netherlands, 208; Anemometers, W. H. Dines, 212; Frequency of Mist, Dr. Kremser, 215; Self-luminous Clouds, C. E. Stromeyer, 225; Remarkable Electrical Phenomena seen at the Santis Observatory, 231; Meteorology in the United States, 231; Meteorology of Mexico for Twelve Years ending 1888, 256; Rainbow due to Sunlight reflected from the Sea, Sir William Thomson, F.R.S., 271; William Scouller, 271; Exact Ther-Thomson, F.R.S., 271; William Scouller, 271; Exact Ther-

mometry, Dr. Sydney Young, 271; Weather Forecasting, 278; Meteorology of the North Atlantic for December 1889, 284; Luminous Clouds, T. W. Backhouse, 297; Joseph John Murphy, 298; Proposed Exhibition illustrating Joseph John Murphy, 298; Proposed Exhibition illustrating Application of Photography to Meteorology, 301; Temperature "Anomalies," 303; Bibliography of Meteorology, General Greely, 303; Report on the Meteorology of Australia, C. L. Wragge, 348; Atmospheric Dust, Dr. Marcet, 358; Atmospheric Circulation, A. Buchan, 363; Shining Night Clouds, Robert B. White, 369; Dependence of Force of Winds upon Surface over which they blow, Dr. van Bebber, 372; Behaviour of Water in Soil, Dr. Wagner, 383; Sun-spots in 1889, Prof. Spörer, 383; on the Number of Dust Particles in the Atmosphere of Certain Places in Great Britain and on the Continent, with Remarks on the Relation between the Amount of Dust and Meteorological Phenomena. John Aitken. Amount of Dust and Meteorological Phenomena, John Aitken, Amount of Dust and Meteorological Phenomena, John Aitken, F.R.S., 382, 394; Meteorology in Japan, 1887, M. Wada, 400; Proposed Meteorological Observatory in Loochoo Islands, 401; the Motion of Dust, Hon. Ralph Abercromby, 406; an Optical Feature of Lightning Flashes, 406; Weather in January, Chas. Harding, 425; Meteorology of Central America, Boletin Trimestral of San José (Costa Rica) Ob-America, Boletin Trimestral of San José (Costa Rica) Observatory, 427; Meteorological Report of the Challenger Expedition, 443; Diurnal Range of Barometer, A. Angot, 449; Waterspout in Atlantic, 470; Preponderance of North-East Wind during past Five Years, C. L. Prince, 470; Meteorology of the Gold and Slave Coast, Dr. Danckelmann, 479; Royal Meteorological Society's Exhibition, William Marriott, 491; Captain Abney's Photo-Nephograph, 491; Pickering's Pole-star Recorder, 491; Photo-Nephograph, Captain Abney's, 491; Report of the Meteorological Council for Year ending March 31, 1889, 495; Use of "Sling" Thermometer in Prediction of Frosts, Prof. H. A. Hazen, 501; Photography in Relation to Meteorological Work, G. M. Whipple, 503; Fire-damp Explosions in Mines in Relationship to Cosmic and Meteorological Conditions, 504; Meteorological Observatory at Fort William, 518; D. 504; Meteorological Observatory at Fort William, 518; D. 504; Meteorological Observatory at Fort William, 518; D. Dewar's Weather and Tidal Forecasts for 1890, 546; Variability of Temperature of British Isles (1859-83), R. H. Scott, F.R.S., 550; Solar Halos and Parhelia, J. Lovell, 560; New Way of giving Information as to Weather on Coasts, 568; Meteorological Observations for 1887 at Greenwich Observatory, 570: Increase of Coldness in China, 570; U.S.A. Signal Service Monthly Weather Review for January 1890, 570; Relative Prevalence of North-East and South-West Winds, William Ellis, 586; Influenza and Weather, Mitchell and Buchan, 596; C. Harding on the Cold in March 1890, 598 Meteors: a Brilliant, Paul A. Cobbold, 32; Remarkable Meteor at Pontevedra, Dr. E. Caballero, 303; a Brilliant Meteor, Wm. teteors: a Brilliant, Paul A. Cobbold, 32; Remarkable Meteor at Pontevedra, Dr. E. Caballero, 303; a Brilliant Meteor, Wm. Scarnell Lean, 60; a Brilliant, J. Cockburn, 81; Brilliant Meteors, P. A. Harris, 105; R. H. Tiddeman, 105; Rev. T. W. Morton, 249; a Greenish Meteor, T. D. A. Cockerell, 369; a Meteor, T. W. Baker, 418; a Remarkable Meteor, J. Dunn, 560; Meteorites of Mexico, M. Daubrée, 71; on the Supposed Enormous Showers of Meteorites in the Desert of Atacama, 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and the supposed Enormous Showers of Meteorites in the Desert of Atacama, 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and the supposed Enormous Showers of Meteorites in the Desert of Atacama, 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and 105; D. Williamskerisch, Beach of Gabeit de Meteorites all intervals and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites and 105; D. Williamskerisch, Beach of Gabeit de Meteorites 108; Die Mikroskopische Beschaffenheit der Meteoriten erläutert durch photographische Abbildungen, G. Tschermak, 127; Die Structur und Zusammensetzung der Meteoreisen erläutert Die Structur und Zusammensetzung der Meteoreisen erlautert durch photographische Abbildungen Geätzter Schnittflächen, A. Brezina und E. Cohen, 127; Die Meteoritensammlung des k.k. Mineralog. Hofkabinetes in Wien, A. Brezina, 127; Examination of the Migheï, of June 9, 1889, Stanislas Meunier, 232; J. Rutherford Hill, 298; Prof. Simaschko, 472; Analogy of South African Diamantiferous Matrix to Meteorites, M. Daubrée, 263; the Physical and Chemical Characteristics of Meteorites are theories. Meteorites, as throwing Light upon their Past History, J. Norman Lockyer, F.R.S., 305 Metric System of Weights and Measures, Thuillier and Water-

house's Conversion Tables, 66

Metrical System, the Babylonian, Dr. Lehmann, 167 Meunier (Stanislas), Examination of Mighei (June 9, 1889) Meteorite, 232

Mexican Amber, G. F. Kunz, 372

Mexico for Twelve Years ending 1888, Meteorology of, 256 Mexico, Hygrometric Club Moss from Mexico, 401

Mexico, Hygrometric Club Moss from Mexico, 401
Mexico, the Eruption of the Volcano Popocatepetl, 592
Meyer (Dr. A. B.): Evolution of Sex, 272; Celebes Photographs, 471; Brush-Turkeys on the Smaller Islands north of Celebes, 514
Meyer (Dr. H.), Rainfall of Germany 1876-85, 85

Meyer (Dr. Hans), the Ascent of Kilimanjaro, 164, 572 Meyrick (E.): Osteolepidæ, 342; Dr. J. A. H. Murray, 343 Mica in Mourne Mountain Granite Geodes, Prof. Sollas, F.R.S.,

469
Michael (Major-General), Forestry, 348
Michaelson (A. A.), Measurement by Light-Waves, 405 Micro-organism conferring Phosphorence on Crustaceans, Discovery by Prof. Giard of, 137

covery by Prof. Giard of, 137

Micro-organisms of Fermentation practically considered, Alfred Jörgensen, Prof. Percy F. Frankland, 339

Microscopy: the Microscope as applied to Physiological Chemistry, Prof. Kossel, 23; Royal Microscopical Society, 93; Ahrens's Polarizing Binocular Microscope, 93; Formation of Scottish and Italian Microscopical Societies, 180; the Microscope in the Brewery and Malt-house, Chas. Geo. Mathews and scope in the Brewery and Malt-house, Chas. Geo. Mathews and Francis Edw. Lott, 246; Tercentenary of the Invention of the Compound Microscope, 256; Zeiss's New Apochromatic Objective Microscope, 494; Microseismic Vibration of the Earth's Crust, Prof. G. H. Darwin, F.R.S., 248 Middlesex Natural History and Scientific Society, 138 Miers (H. A.), Crystals of Lime, 515, 560 Mighei, the Meteorite of, Stanilas Meunier, 232; J. Rutherford Hill 208

Hill, 298
Milan, Discovery of Lake-Dwelling near, 67
Millipede, a Marine, 104; Edward Parfitt, 153; R. I. Pocock,

Mills (Dr. Edmund J., F.R.S.), Traité pratique de la Thermo-métrie de précision, Ch. Ed. Guillaume, 100; Exact Thermometry, 227, 538
Mills (John) and Barker North, Introductory Lessons in Quanti-

tative Analysis, 197

Miner, Fall of a, without being killed, down a 100-metre Shaft, M. Reumeaux, 471

Mineralogy: Mineralogical Magazine, 67; Statistics of Minera-logy in Canada, 87; Great Find of Rare Minerals of Yttrium and Thorium Groups in Texas, 162; Provincial Index of the Minerals of India, Dr. W. King, 546; Mines at Bendigo, Victoria, Report of School of, 209; Mining and Metallurgy, Proposed International Exhibition of, 447; Mining and Metallurgy, International Exhibition of, at the Crystal Palace,

Minimum Sun-spot Period, M. Bruguière, 68
Minor Planet (12), Victoria, Dr. Gill, 139
Minor Planets, Clorinde, 88
Mint, Royal, the New Assistant Secretary at, T. Rose Kirke, 493
Mirage in the South American Pampas, W. Larden, 69

Mirage in the South American Pampas, W. Larden, 69
Mirages, Arthur E. Bröwn, 225
Missouri Botanical Garden, 209
Mist, Frequency of, Dr. Kremser, 215
Mitchell (Sir Arthur), Influenza and the Weather, 596
Mite of the Genus *Tetranychus* found infesting Lime Trees in
the Leicester Museum Grounds, on the, F. R. Rowley, 31
Mivart (Dr. St. George, F.R.S.), Prof. Weismann's Essays,
28. Gells 174

38; Galls, 174
Modern Views of Electricity, 102
Modigliani's Exploration of Nias Island, Prof. Giglioli, 587

Moebius (Prof.), Drumming Fish (Balistes acuteatus), 263
Moissan (Henri): a New Method of Preparing Fluorine, 117;
the Anhydrous Platinous Fluorine, 119; Perfected Mode of
Preparing Fluorine, 138; Colour and Spectrum of Fluorine,
214; Phosphorus Trifluoride, 349; Two Gaseous Fluorides of

Carbon, 373 Mole, the Eye of the, Carl Hess, 373

Molecular Stability of Metals, particularly of Iron and Steel, Carl Barus, 369

Molecular Structure, the Relation between Atomic Volumes of Elements present in Iron, and their Influence on its, Prof.

W. C. Roberts-Austen, F.R.S., 420
Molucca Islands, Count Salvadori on the Birds of, 85
Monck (Dr. W. H. S.): Satellite of Algol, 198; the Distances

of the Stars, 392 Monkey, the Barbados, Colonel H. W. Feilden, 349 Monkey, Bonnet, Arrangement of Excitable Fibres of Internal Capsule of, Beevor and Horsley, 166 Monkeys, African, in the West Indies, Dr. P. L. Sclater, F. P. S. 466

F.R.S., 368 Montigny (Prof. C. M. V.), Death and Obituary Notice of, 497 Montpellier University, Proposed Commemoration of Founding

Montsouris Observatory, the Effect of Railways on Instruments in, 592

Moon in London, the, Rev. T. R. R. Stebbing, 586 Moore (John Murray), New Zealand for the Emigrant, Invalid, and Tourist, 342

Moore (Spencer): True Nature of Callus, 478; Nessler's Ammonia Test as a Micro-chemical Reagent for Tannin,

Morea, Rock-sepulchre at Vaphio, S. Reinach, 500 Morgan (Prof. C. Ll.), the Pebidian Volcanic Series of St. David's, 311

Morley Memorial College and the Royal Victoria Hall, 343 Morocco, Travels in, Walter B. Harris, 270 Morris (D.): Seeding of Sugar-cane, 478; the Native Ebony of

St. Helena, 519 Morris (Dr. G. H.), Identity of Cerebrose and Galactose, 262

Mortillet (M. de), the Dog, 332 Morton (Rev. T. W.), Meteor, 249 Moscow Archæological Congress, 283

Moser (James), Electrical Oscillations in Rarefied Air, 431 Moss (F. J.), Through Atolls and Islands in the Great South

Sea, 151 Moss, Hygrometric Club, from Mexico, 401 Mount Hamilton, Longitude of, 211

Mount Vesuvius, J. Logan Lobley, 195
Mouse-Hunt, a Kind of Weasel, E. B. Titchener, 394
Mozambique, Arrival of Captain Trivier at, 165
Muirhead (B. A.), Ten and Tenth Notation, 344
Muirhead (Geo.), the Birds of Berwickshire, R. Bowdler Sharpe,

169 Müller (Prof. Max): Necessity of a School for Modern Oriental Studies, 255; Thought and Breathing, 317
Multiple Resonance obtained in Hertz's Vibrators, Prof. Geo. Fras, Fitzgerald, 295; Fred T. Trouton, 295

Munk (Dr.): Absorption of Fats and Fatty Acids in Absence o Bile in Intestine, 119; the Cortical Visual Areas, 407; Fat the only Food leaving Intestines by Lacteals, 504 Munro's Wind-measuring Instruments, 492

Murchison, Sedgwick and, Cambrian and Silurian, Prof. James D. Dana, 421 Murphy (Joseph John): the Permanence of Continents and

Oceans, 175; Luminous Clouds, 298 Murray (Dr. John), Coral Reefs in Recent Seas, 167

Murray-Aynsley (Mrs. J. C.), Thought and Breathing, 441
Museums: Opening of the Berlin National Science, 112;
Suggestions for the Formation and Arrangement of a Museum

of Natural History in Connection with a Public School, Prof.
W. H. Flower, F.R.S., 177; Cambridge Archæological,
324; Annual Meeting of Museums Association, 591
Music on Animals, Effect of, R. E. C. Stearns, 470

Music, Dogs and, 372 Music, Visualized Images produced by, Geo. E. Newton, 417 Musical Sounds, the Effect of, on Animals, R. E. C. Stearns,

Muthmann (Dr.), Crystalline Allotropic Forms of Sulphur, 449 Muzzling Regulations, the New, 241

Nansen's (Dr.) Plan for North Pole Expedition, 374 Naphthalene, Constitution of Tri-derivatives of, Armstrong and

Wynne, 454
Natality of Paimpol, M. Dumont, 332

National Union of Teachers, 545
National Union of Teachers, 545
Native Colonists, French, in Paris, 427
Natural Evidence of High Thermal Conductivity in Flints, Prof. A. S. Herschel, F.R.S., 175
Natural History: Suggestions for the Formation and Arrange-

atural History: Suggestions for the Formation and Arrangement of a Museum of Natural History in connection with a Public School, Prof. W. H. Flower, F.R. S., 177; Catalogue of the Fossil Reptilia and Amphibia in the British Museum, Richard Lydekker, 534; on some Needless Difficulties in the Study of Natural History, Dr. C. T. Hudson, F.R. S., 375; Glimpses of Animal Life, W. Jones, 409; Toilers in the Sea, M. C. Cooke, 409; Les Industries des Animaux, F. Houssay, 409; Natural Selection, Lamarck versus Weismann, Prof. E. D. Cope, 79; Prof. G. J. Romanes, F.R. S., on the Formation of Galls, 80; Naturalist in North Celebes, Sydney J. Hickson, Dr. F. H. H. Guillemard, 457; the Physician as Naturalist, W. T. Gairdner, 436; Naturalistic Photography, Naturalist, W. T. Gairdner, 436; Naturalistic Photography,

P. H. Emerson, 366 NATURF, Progress of, during Twenty Years, 1 Navigation, der Kompass an Bord, Dr. Neumayer, 412

Nebula N.G.C. 2237, the Cluster G.C. 1420 and, Dr. Lewis

Swift, 285 Nebula, General Catalogue No. 4795, W. E. Jackson, 450

Nebular Hypothesis, Herbert Spencer, 450 Neo-Darwinians, Duke of Argyll and the, W. T. Thiselton-

Dyer, F.R.S., 247 Nessler's Ammonia Test as a Micro-chemical Reagent for

Tannin, Spencer Moore, 585 Nervous Affection observed in an Insect, Note on a Probable, E. W. Carlier, 197

Netanson (Ladislas), the Characteristic Temperatures, Pressures, and Volumes of Bodies, 167

Neumayer (Dr.), der Kompass an Bord, 412 Neumayr (Prof.), Death of, 324 New Light from Solar Eclipses, William M. Page, William E. Plummer, 529 New Guinea, Kaiser Wilhelmsland, the North Coast of,

Admiral von Schleinitz, 21 New Guinea and the Molucca Islands, Count Salvadori on the

Birds of, 85

Birds of, 85
New Guinea, Sir Wm. McGregor's Explorations in, 374
New South Wales: Technical Education in, 66; Royal Society
of, 96; Meteorology of, H. C. Russell, 113
New Zealand, Discovery of Cave Dwelling in, H. O. Forbes, 209
New Zealand for the Emigrant, Invalid, and Tourist, John Murray Moore, 342 Newall Telescope for the University of Cambridge, 166; the

Maintaining and Working of the, 357
Newcastle Learned Societies' Annual Gathering, 519
Newton (Geo. E.), Visualized Images produced by Music, 417
Newton in Perspective, Robert H. Graham, 439
Nias Island, Modigliani's Exploration of, Prof. Giglioli, 587

Nickel and Iron, the Villari Critical Points in, Herbert Tomlinson, F. R. S., 574 Night-Clouds, Luminous: Evan McLennan, 131; Photographs

Night-Clouds, Luminous: Evan Records, of, O. Jesses, 592
Nitrogen in Soils, Sources of, Prof. John Wrightson, 286
Niven (W. D., F.R.S.), on certain Approximate Formulæ for
Calculating the Trajectories of Shot, Prof. J. C. Adams, 258
Noe's (Dr. Franz) Geologische Uebersichtskarte der Alpen, Prof.
T. G. Bonney, F.R.S., 483
Nordenskiöld (A. E.), Facsimile Atlas to the Early History of

Cartography, 558 Norfolk and Norwich Naturalists' Society, 519

North America, Cave Fauna of, with Remarks on the Anatomy of the Brain and Origin of the Blind Species, A. S. Packard, 507 North (Barker) and John Mills, Introductory Lessons in Quan-

titative Analysis, 197 North Celebes, a Naturalist in, Sydney J. Hickson, Dr. F. H.

H. Guillemard, 457 Northwich, Subsidence at, 230 Nuovo Giornale Botanico Italiano, 405

Oates (E. W.), Ornithology of India, Vol. I., 388 Oates (Frank), Matabele Land and the Victoria Falls, R. Bowdler Sharpe, 169

Objects for the Spectroscope, A. Fowler, 20, 44, 68, 87, 114, 138, 163, 183, 210, 232, 257, 285, 304, 326, 350, 374, 402, 428, 449, 472, 521, 548, 571, 595

Observatories: Karlsruhe Observatory, A. Fowler, 20; Palermo,

88; Paramatta, 88; Greenwich, 305; Dun Echt, 351; Melbourne, 351; Astronomical Observatory of Harvard College, 446; Vatican, 472; Madagascar, 497; the Effect of Railways

on Instruments in, 592 Observatory: Proposed Meteorological, in Loochoo Islands, 401;

Fort William Meteorological, 518
Ocean Currents, Distribution of Animals and Plants by, Rev.

Paul Camboué, 103
Ocean, German, Botanical Condition of, Major Reinhold, 569
Ocean Water, is the Bulk of, a Fixed Quantity, A. J. Jukes-Browne, 130; T. Mellard Reade, 175; Rev. O. Fisher, 197
Oceans, Area of the Land and Depths of the, in Former Periods, T. Mellard Reade, 103

Oceans, the Permanence of Continents and, Joseph John

Murphy, 175
Odontology: Who Discovered the Teeth in Ornithorhynchus?
Dr. C. Hart Merriam, 11, 151; Prof. W. H. Flower, F.R.S.,
30, 151; Prof. Oswald H. Latter, 30, 174
Oil on Disturbed Water, Effect of, Richard Beynon, 205; A. B.

Old Age, Dr. Geo. M. Humphry, F.R.S., 484 Olfactometer, Dr. Zwardemaaker, 349

Olive Cultivation in India, 303 Oliver (Dr. Francis), the Weather Plant (Abrus precatorius),

283
Olliff (A. S.), Extraordinary Abundance of Noctuid Moth (Agrotis spina) in New South Wales in October, 161
Oölogy: the Nests and Eggs of Indian Birds, by Allan O. Hume, Vol. I., 388; A. J. Campbell's Collection of Eggs in Western Australia, 593. See also Eggs
Opera Glass, Astronomy with an, Garrett P. Serviss, 462
Ophiuchus, New Short Period Variable in, 403
Opossum in Tasmania, Destruction of, 304
Optics: Geometrical, Notes on (II.), Prof. S. P. Thompson, 213; Traité d'Optique, M. E. Mascart, Prof. J. D. Everett, F.R.S., 224; Vision-Testing for Practical Purposes, Brudenell Carter, 302; Measurement by Light-Waves, A. A. Michelson, 405: Abbe's Apparatus for Testing Transparent Films with Plane Parallel Surfaces, Dr. Lummer, 552
Oranges and Lemons of India and Ceylon, the Cultivated, Dr.

Oranges and Lemons of India and Ceylon, the Cultivated, Dr. E. Bonavia, C. B. Clarke, F.R.S., 579
Orbit of Swift's Comet (V. 1880), 257
Orbits of the Companions of Brooks's Comet (1889 V., July 6),

Ornithology: Argentine Ornithology, P. L. Sclater, F.R.S., and W. H. Hudson, R. Bowdler Sharpe, 7; Count Salvadori on the Birds of New Guinea and the Molucca Islands, 85; and W. H. Husson, K. Bowdier Sharpe, 7; Count Salvador on the Birds of New Guinea and the Molucca Islands, 85; Pheasant-Culture on the Pacific Coast, Dr. Meriam, 137; the Food of Crows, W. B. Barrows, 137; Notes on Sport and Ornithology, H.I.H. the late Prince Rudolph of Austria, 169; Matabele Land and the Victoria Falls, Frank Oates, 169; Index Generum Avium, F. H. Waterhouse, 169; Birds of Oxfordshire, O. V. Aplin, 169; the Birds of Berwickshire, Geo. Muirhead, 169; the Birds in my Garden, W. T. Greene, R. Bowdler Sharpe, 169; Birds that have struck the Statue of Liberty in New York Harbour, Jonathan Dwight, Junior, 181; Chiff Chaff Singing in September, 298; Rev. W. Clement Ley, 317; Pallas's Cormorant, 373; Oates's Ornithology of India, Vol. I., R. Bowdler Sharpe, 388; the Nests and Eggs of Indian Birds, by Allan O. Hume, Vol. I., edited by E. W. Oates, R. Bowdler Sharpe, 388; the Chaffinch, E. J. Lowe, F.R.S., 394; A. J. Campbell's Collections of Western Australian Bird-Skins and Eggs, 593; Effects of Music on a Canary, 593; Dr. R. W. Shufeldt on Avian Anatomy, 594

Effects of Music on a Canary, 593; Dr. R. W. Shander Avian Anatomy, 594.
Ornithorhynchus, Who discovered the Teeth in the, Dr. C. Hart Merriam, 11, 151; Prof. W. H. Flower, F.R.S., 30, 151; Prof. Oswald H. Latter, 30, 174
Orycteropus, a Milk Dentition in, O. Thomas, 309
Osborn (H. Leslie), a Preservative for Animal Tissues, 199
Osborn (Henry Fairfield), Palæontological Evidence for the Transmission of Acquired Characters, 227
Osteolepidæ, 271, 342: E. Meyrick, 342

Osteolepidæ, 271, 342; E. Meyrick, 342 O'Sullivan (C., F.R.S.), Arabinon, 262 Oudemans (Prof. J. A. C.) on Star Distances, 81 Oxford "Pass" Geometry, 467 Oxfordshire, the Birds of, O. V. Aplin, R. Bowdler Sharpe,

169

Ozone, Production by Flames of, J. T. Cundall, 502

Pacific Coast, Pheasant Culture on, Dr. Meriam, 137 Pacific, Notes on a Recent Volcanic Island in the, Captain W. J. L. Wharton, F.R.S., 276
Pacific Slope, Geology of the Quicksilver Deposits of the, G.

F. Becker, 532
Packard (A. S.), Cave Fauna of North America, with Remarks on the Anatomy of the Brain and Origin of the Blind Species,

 507
 Page (William M.), New Light from Solar Eclipses, William E. Plummer, 529
 Paimpol, Natality of, M. Dumont, 332
 Painter (Rev. W. H.), the Flora of Derbyshire, 77
 Palæontology: Fossil Rhizocarps, 10, 154; Gigantic Fossil Elephant's Tusk discovered in Italy, 66; Dr. H. Burmeister on the Fossil Horses and other Mammals of Argentina, 82; Palæontological Evidence for the Transmission of Acquired Characters. Henry Fairfield Osborn, 227; Primitive Types of Characters, Henry Fairfield Osborn, 227; Primitive Types of Mammalian Molars, 465; Antediluvian Remains discovered at Ludwigshafen, 520

Palermo Observatory, 88

Palestine Exploration Fund, 284; Excavation of Khurbet 'Ajlân,

592
Palisa (Dr.), Discovery of Asteroids, 522
Palladium, Redetermination of Atomic Weight of, Dr. E. H.

Keiser, 44
Palm in Labuan, the African Oil, 42
Palmieri (Prof.), Vesuvius in 1889, 18
Mirage in the South America Pampas, Mirage in the South American, W. Larden, 69 Pampas Formation, the South American, Herr Roth, 231

Palæontological Evidence for the Transmission of Panmixia: Palæontological Evidence for the Transmission of Acquired Characters, Henry Fairfield Osborn, 227; Acquired Characters and Congenital Variations, the Duke of Argyll, F.R.S., 173, 294, 366; Acquired Characters and Congenital Variations, W. T. Thiselton-Dyer, F.R.S., 315; F. V. Dickins, 316; Prof. E. Ray Lankester, F.R.S., 415, 486, 558; Acquired Characters and Congenital Variations, Right Rev. Bishop R. Courtenay, 367; Dr. J. Cowper, 368; Herbert Spencer, 414; Prof. Geo. J. Romanes, F.R.S., 437, 511, 584; Herbert Spencer, 511; R. Haig Thomas, 585 Parallelogram of Forces, Proof of the, W. E. Johnson, 153; Prof. A. G. Greenhill, F.R.S., 298 Paramatta Observatory, 88 Parfitt (Edward), a Marine Millipede, 153

Parfitt (Edward), a Marine Millipede, 153
Parhelia and Solar Halos, 330; J. Lovell, 560
Parinaud (H.) Strebismus, 72

Parinaud (H.), Strabismus, 72
Paris Academy of Sciences, 23, 48, 71, 94, 119, 143, 167, 214, 263, 287, 311, 335, 358, 382, 406, 431, 455, 479, 503, 528, 551, 575, 599; Prizes, 239
Paris, the Effect of Railways on Instruments in the Observatory

at Montsouris, 592
Paris Exhibition, English Men of Science decorated at, 17
Paris, Foreign Students in, 520
Paris from the Hygienic Point of View, French Native Colonists

in, 427 Parkes (Louis C.), Hygiene or Public Health, 290 Particles and Solids, Elementary Dynamics of, W. M. Hicks,

F.R.S., 534

Pascoe (Francis P.), Foreign Substances attached to Crabs, 176 Pasteur Institute, 66

Pasture Plants, Practical Observations on Agricultural Grasses

and other, William Wilson, 196
Peal (S. E.), Is Greenland our Arctic Ice Cap?, 58
Peculiar Ice Forms, Prof. J. G. MacGregor, 463
Peddie (Dr.), New Estimates of Molecular Distance, 382

Pegasi (n), the Companion of, 69

Pelew Islands, 433 Peltier, Effect and Contact E.M.F., Prof. Oliver J. Lodge, F.R.S., 224

F.R.S., 224
Pembrey (M. S.), the Evolution of Sex, 199
Penck (Dr.), Area of Austro-Hungarian Empire, 325
Pendlebury (W. H.), a Case of Chemical Equilibrium, 104
Pendulum (Kater), Shuckburgh Scale and, O. H. Tittman,

Pennyslvania, Earthworms from, W. B. Benham, 560 Peradeniya, Ceylon, Botanical Laboratory in the Royal Gardens,

445
Periodic Comets, 139
Periodic Law, a First Foreshadowing of the, P. G. Hartog,

Periscope for Navigating Submarine Boat, 349

Perkin (Dr. W. H., F.R.S.), Magnetic Rotation of Nitric Acid, &c., 142

Permanence of Continents and Oceans, Joseph John Murphy, 175

Permanent Grass, a Field laid down to, Sir J. B. Lawes,

F.R.S., 229 Pernter (Dr.), General Circulation of Atmosphere,

Perry (Prof., F.R.S.), the Behaviour of Atmosphere, 325
Perry (Prof., F.R.S.), the Behaviour of Twisted Strips, 47
Perry (Rev. S. J., F.R.S.): Sun-spots in High Southern Latitudes, 88; Total Solar Eclipse of 1886, 88; Obituary Notice of, 279; Last Days of, Father Strickland, S.J., 301
Perspective, Newton in, Robert H. Graham, 439
Perthshire, Earthouse in act

Perthshire, Earthquake in, 256
Peruvian Arc, the Measurement of, E. D. Preston, 309

Peters (Dr.), Reported Massacre of, 21 Peters (Dr.), Star Catalogue, 210

Petit (P.), the Carbon Graphites, 311
Petrie (W. M. Flinders), Early Egyptian Civilization, 109
Pevtsoff (Colonel), Discovery of New Pass from Nia to Tibet by,

Pheasant-Culture on Pacific Coast, Dr. Meriam, 137

Phenanthraquinone with Metallic Salts, Compounds of, Japp and

Philadelphia, American Philosophical Society, 136 Philadelphia, American Philosophical Society, 136 Philippine Islands, Ethnology of the, Dr. F. Blumentritt, 327 Phillips (Reuben), Globular and other Forms of Lightning, 58

Phillips (Reuben), Globular and other Forms of Lightning, 58
Philology, a Uniform System of Russian Transliteration, 396;
Chas. E. Groves, F.R.S., 534; W. F. Kirhy, 535
Philosophical Institute of Canterbury, N.Z., 209
Philosophy, Synthetic, F. Howard Collins, 340
Phonograph, the Edison, Use in Preserving American Indian Languages, J. W. Fewkes, 560
Phosphorus, Glow of, Prof. T. E. Thorpe, F.R.S., 523
Phosphorus Trifluoride, M. Moissan, 349
Photography: on a New Application of Photography to the Demonstration of Certain Physiological Processes in Plants, Walter Gardiner, 16; Stellar Parallax by Means of Photography, Prof. Pritchard, F.R.S., 19; Photography of the Red End of Spectrum, Colonel J. Waterhouse, 67; Photographic Star Spectra, 115; Die mikroskopische Beschaffenheit der Meteoriten erläutert durch photographische Abbildungen, G. Tschermak, 127; Die Structur und Zusammensetzung der Meteoreisen erläutert durch photographische Abbildungen Meteoreisen erläutert durch photographische Abbildungen geätzter Schnittslächen, A. Brezina and E. Cohen, 127; the Photographic Society, 208; Billiothèque Photographique, P. Moëssard, 224; Application of Photography to the Study of Moëssard, 224; Application of Photography to the Study of Physical Peculiarities engendered by Different Occupations, M. Bertillon, 230; the Chemistry of Photography, R. Meldola, F.R.S., 293; Proposed Exhibition Illustrating the Application to Meteorology of Photography, 301; French Wurks on Photography, 326; Year-book of Photography, 1890, 326; Naturalistic Photography, P. H. Emerson, 366; the Camera Club, 494; Photographs of North Celebes, Dr. A. B. Meyer, 471; Photographing in Natural Colours, Verescz's Discovery as to, 469; Photography in Relation to Meteorological Work, G. M. Whipple, 502; British Journal Photographic Almanac. as to, 409; Photography in Relation to Meteorological Work, G. M. Whipple, 503; British Journal Photographic Almanac, 1890, 510; Suppression of Halos in Photographic Plates, Paul and Prosper Henry, 576; La Photographie a la Lumière du Magnésium, Dr. J. M. Eder, translated by H. Gauthier-Villars, 584; Photographic Quarterly, 594
Photo-lithographs of some of the Principal Grasses found at

Hissar, being Illustrations of some of the Grasses of the Southern

Punjab, William Coldstream, 533
Photometer, New Contrast, Dr. Brodhun, 552
Photometer, a New Wedge, E. J. Spitta, 287
Photometric Intensity of Coronal Light, Prof. Thorpe, F.R.S.,

139 Phthisis, Pulmonary, Dr. Weigert's Treatment of, Prof. Visconti,

Physician admitted to Medical Practice in Austria, First Lady,

Physician as Naturalist, W. T. Gairdner, 436

Linductive Capacity, W. A. Rudge, 10; Physics: Specific Inductive Capacity, W. A. Rudge, 10; Physical Society, 47, 166, 213, 309, 381, 477, 526, 574; Physics of the Sub oceanic Crust, Rev. Osmond Fisher, A. J. Physics of the Sub-oceanic Crust, Rev. Osmond Fisher, A. J. Jukes-Browne, 53; J. Starkie Gardner, 103; Elementary Physics, by M. R. Wright, 78; Physical Society of Berlin, 95; the Characteristic Temperatures, Pressures, and Volumes of Bodies, Ladislas Netanson, 167; the Relation of Physiological Action to Atomic Weights, Miss Johnston and Prof. Carnelley, 189; Behaviour of Steel under Mechanical Stress, C. H. Carus-Wilson, 213; Resonance Method of Measuring Constant Carus-Wilson, 213; Resonance Method of Measuring Constant of Gravitation, J. Joly, 256; Physical and Chemical Characteristics of Meteorites as throwing Light upon their Past History, J. Norman Lockyer, F.R.S., 305; Physics and Chemistry of the Challenger Expedition, 361; Physical Properties of Water, Prof. P. G. Tait, 416; Prof. Arthur W. Rücker, F.R.S., 416; Tension of Recently Formed Liquid Surfaces, Lord Rayleigh, 566
Physiology: on a New Application of Photography to the Demonstration of Physiological Processes in Plants, Walter Gardiner,

stration of Physiological Processes in Plants, Walter Gardiner, 16; the Coiled Glands in the Skin, Dr. Benda, 24; Iron in the 16; the Coiled Glands in the Skin, Dr. Benda, 24; Iron in the Animal Organism, Dr. Schneider, 24; Physiological Notes on Primary Education and the Study of Language, Mary Putnam Jacobi, 28; Physiology at the University of Cambridge, 41; Mechanism of Local Lesion in Infectious Diseases, Ch. Bouchard, 48; Local Paralysis of Peripheral Ganglia and Connection of Nerve-fibres with them, Langley and Dickinson, 118; on the Absorption of Fats and Fatty Acids in the Absence of Bile in the Intestine, Dr. J. Munk, 119; on Diastases secreted by Bacillus heminecrobiophilus, M. Arloing, 143; the Influence of Blood-Circulation and Breath-Arloing, 143; the Influence of Blood-Circulation and Breath-

ing on Mind-Life, Prof. Leumann, 209; Electrical Negative Variation of Heart accompanying Pulse, Dr. Aug. Waller, 288; Outlying Nerve-Cells in Mammalian Spinal Cord, C. S. Sherrington, 388; the Cortical Visual Areas, Dr. J. Munk, 407; Influence of Bodily Labour on Metabolism of Man, Dr. Katzenstein's Experiments, 479; Physiology of Bodily Exer-Contraction, Dr. Haycraft, 495; Physiology of Bodily Exercise, Dr. Fernand Lagrange, 485; Voluntary Muscular Contraction, Dr. Haycraft, 495; Development of Ciliary Ganglion, Dr. J. C. Ewart, 501; Fat the only Food leaving Intestines by Lacteals, Dr. J. Munk, 504; Myelin, Dr. Heymans, 528; Sensitiveness of Articular Surfaces of Joints, Dr. Goldscheider, 528; Physiology of Sponges, Dr. Lendenfeld, 570

Pickering (Prof. E. C.), Variable Star in Cluster G.C. 3636, 183; on the Spectrum of ζ Ursæ Majoris, 285; on ζ Ursæ Majoris and β Aurigæ, 403; Pole-Star Recorder, 491;

New Variable in Cælum, 571

Pickering (Prof. S. U.), Isolation of Tetrahydrate of Sulphuric Acid existing in Solution, 142; Theory of Osmotic Pressure,

Picton (Harold, F.R.S.), the Story of Chemistry, 292
Pietra Papale, La, Dr. P. L. Sclater, F.R.S., 31
Pigment, Carotine, in Alpine Lake Crustacean, Discovery by
Prof. Raphael Blanchard of, 325
Pigment of the Touraco and the Tree Porcupine, Frank E.

Pignent of the Foundation and the Beddard, 152
Pilot Chart of North Atlantic, 284
Pinks of Western Europe, F. N. Williams, 78
Pinnow (Dr.), Analysis of Carcote (Chili) Meteorite, 428 Pinol, Nitrosochloride of, a New Isomer of Camphor, 44

Pipe, Interesting American Indian, H. B. Bashore, 303
Pisciculture: Change in Character of Salmon Acclimatized in
Tasmania, 43; the Habits of the Salmon, Major John P.

Traherne, 74
Planck (Prof.), Development of Electricity and Heat in Dilute
Electrolytic Solutions, 215
Dr. Gill. 130

Electrolytic Solutions, 215
Planet, Minor (12), Victoria, Dr. Gill, 139
Planets, the Movement of, F. Tisserand, 406
Plantamour (M.), Periodic Ground-movements, 373
Plants, Diseases of, Prof. H. Marshall Ward, F.R.S., 436
Plants, Fossil, of Coal-Measures, Organization of, Prof. W. C.
Williamson, F.R.S., 573
Plants, on a New Application of Photography to the Demonstra-

tion of certain Physiological Processes in, Walter Gardiner, Plants, Prof. Walter Gardiner on how they maintain themselves

in the Struggle for Existence, 90 Platt (Margaret) and the Chemical Laboratory at Stalybridge Mechanics' Institute, 85

Playfair (Sir Lyon, F.R.S.), the Need for Vital Improvements in

English Education, 180 Plummer (William E.), New Light from Solar Eclipses, William

M. Page, 529 Pluvinel (M. A. De La Baume), Total Solar Eclipse of December 22, 1889, 428

Pocock (R. I.), a Marine Millipede, 176

Poincaré (M.), Équations aux Derivées Partielles de la Physique

Mathématique, 525

Politics, Elements of Historical and Practical, Woodrow Wilson,

Polynesia, Through Atolls and Islands in the Great South Sea, F. T. Moss, 151 Polytechnic, a South London, 481 Polytechnics for London, 242 Pontevedra, Remarkable Meteor at, Dr. E. Caballero, 303

Poona Bacteriological Laboratory, 469
Pope (R. Barrett), Thought and Breathing, 297
Popocatepetl, the Eruption of the Volcano, 592
Porcupine, Tree, the Pigment of the, Frank E. Beddard,

Portugal, Earthquake in, 401 Potsdam Magnetic Observatory, Dr. Eschenhagen, 479
Powell (J. W.), Sixth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1884-85,

Prehistoric Textiles, Herr Buschan, 182 Preservative, a, for Animal Tissues, H. Leslie Osborn, 199
Pressure-Gauge, Bourdon's: Prof. A. M. Worthington, 296;
Prof. A. G. Greenhill, F.R.S., 517
Preston (E. D.), Measurement of the Peruvian Arc, 309
Prestwich (Prof. Joseph, F.R.S.): Relation of Westleton Beds

of Suffolk and Norfolk, 238; Relation of "Pebbly Sands" of Suffolk to those of Norfolk, Part iii., 502 Primitive Types of Mammalian Molars, 465

Primrose, a Blue, 569
Primce (C. L.), Preponderance of North-East Winds during
Past Five Years, 470
Pringsheim (Dr. E.), Kirchoff's Law and Gaseous Radiation,

Prism, Bertrand's Idiocyclophanous, Prof. S. P. Thompson,

574
Pritchard (Prof., F.R.S.), Stellar Parallax by Means of Photo-

graphy, 19
Probabilities, Calculus of, J. Bertrand, 6
Proceedings of the Royal Society of Edinburgh, 114
Prominences, Solar Spots and, Prof. Tacchini, 233
Propagation of Gravitation, Velocity of the, J. Van Hepperger,

472
472
Protective Coloration of Eggs: Dr. Alfred R. Wallace, 53;
Rev. Fred. F. Grensted, 53; E. B. Titchener, 129
Prussia, Wapiti Acclimatized in, 546
Przewalsky's (N. M.) Zoological Discoveries, 468

Psychology of Attention, Th. Ribot, 460
Psychology: the Society for Psychical Research, 17

Public School, Suggestions for the Formation and Arrangement of a Museum of Natural History in connection with a, Prof. W. H. Flower, F. R. S., 177 Puffin Island Marine Biological Station, 304

Pulsion Mechanical Telephone, 65 Punjab Forest Administration Report, 520

Purtscheller (Prof.), the Ascent of Kilimanjaro, 164

Quantitative Analysis, Introductory Lessons in, John Mills and Barker North, 197

Quarter Squares, the Method of, J. W. L. Glaisher, F.R.S., 9 Quarterly Journal of Microscopical Science, 549 Quenstedt (Prof. von), Death and Obituary Notice of, 400

Quesneville (Dr.), Death of, 84 Quicksilver Deposits of the Pacific Slope, Geology of the, G. F. Becker, 532

Radiation by Gas-Flame, Luminous and Non-Luminous, Sir John Conroy, 357

Raffy (L.), Determination of Regulated Harmonic Surfaces, 359 Railway, North-Eastern: the Latest Express Compound Loco-

motive, 448
Railway, Proposed Jungfrau, Herr Trautweiler, 303
Railways, the Effect of, on Instruments in Observatories, 592
Railways of England and Scotland, W. M. Acworth, 434

Rainbow due to Sunlight Reflected from the Sea, Sir W. Thomson, F.R.S., 271; W. Scouller, 271
Rainbows, Eight, seen at the same time, Sir William Thomson, F.R.S., 316; Dr. Percival Frost, F.R.S., 316
Rainfall in America, 92

Rainfall of the Earth, by late Prof. Loomis, Dr. van Bebber, 43 Rainfall of Germany 1876-85, Dr. H. Meyer, 85 Ramsay (Prof. William, F.R.S.): Compounds of Selenium, 343;

Ramsay (Prof. William, F.R.S.); Compounds of Scieniam, 343; Nitrous Anhydride and Nitric Peroxide, 454
Raoult (F. M.), Vapour-pressure of Acetic Acid Solutions, 431
Rat, the Old English Black, in Cornwall, Thos. Cornish, 161
Rat Plague in Laccadive Islands, 303
Raven, the Anatomy of the, Dr. R. W. Shufeldt, 594
Rayleigh (Lord, F.R.S.), Tension of Recently Formed Liquid

Surfaces, 566
Reade (T. Mellard): Does the Bulk of Ocean Water Increase?
175; Area of the Land and Depths of the Oceans in Former Periods, 103

Reading Room, British Museum, Ventilation of, 199 Recoura (A.), Vapour-pressure of Acetic Acid Solutions, 431

Red Sea, Locusts in the, G. T. Carruthers, 153
Red Sea, Locusts in the, G. T. Carruthers, 153
Redway (J. W.), Teacher's Manual of Geography, 78
Refractometer, Bertrand's, Dr. S. P. Thompson, 526
Reinach (S.), Rock-Sepulchre at Vaphio, Morea, 500
Reinhold (Major), Botanical Condition of German Ocean, 569
Reinke (Dr. J.): a New Atlas of Algæ, 127; the Botanical
Institute and Marine Station at Kiel, 397
Religion of the Semites, Lectures on the, Prof. W. Robertson

Smith, 337 Renard (Prof. A.): Phenyl-Thiophene, 48; Rock-Specimens

collected on Oceanic Islands, 363

Rendiconti del Reale Istituto Lombardo, 212, 380 Resonance, Electric, Easy Lecture Experiment in, Prof. Oliver

J. Lodge, F.R.S., 368
Respighi (Prof. Lorenzo): Death of, 160; Obituary Notice of, W. T. Lynn, 254
Reumeaux (M.), Fall of Miner down 103-metre Shaft without

being killed, 471 Review, New Russian Natural Science, 409

REVIEWS and OUR BOOK SHELF:

Modern Views of Electricity, Prof. Oliver J. Lodge,

F.R.S., 5
Calcul des Probabilités, J. Bertrand, 6
Argentine Ornithology, P. L. Sclater, F.R.S., and W. H.
Hudson, R. Bowdier Sharpe, 7
Chemistry of the Coal-Tar Colours, Dr. R. Benedikt, 8

Bibliography of Geodesy, J. Howard Gore, 9 Lund Museum in the University of Copenhagen, 26

Hydraulic Motors, Turbines and Pressure Engines, G. R. Bodmer, 27 Physiological Notes on Primary Education and the Study of

Physiological Notes on Frimary Education and II Language, Mary Putnam Jacobi, 28 Steam-Engine Design, Jay M. Whitham, 29 Coloured Analytical Tables, H. W. Hake, 29 Story of a Tinder-Box, Chas. M. Tidy, 30 Magnetism and Electricity, Andrew Jamieson, 30 Magnetism and Electricity Andrew Magnetism and Electricity and Electricity Andrew Magnetism and Electricity and Electricity

Time and Tide, a Romance of the Moon, Sir Kobert S. Ball,

F.R.S., 30
Chemical and Physical Studies in the Metamorphism of Rocks, based on the Thesis written for the D.Sc. Degree in the University of London, 1888, Rev. A. Irving, 49
Hand-book of Descriptive and Practical Astronomy, G. F.

Chambers, 49

Proceedings of the National Electric Light Association at its Ninth Convention, 1889, 50
Enumeratio Specierum Varietatumque Generis Dianthus, F.

N. Williams.

N. Williams, 51
Magnetism and Electricity, Arthur W. Poyser, 52
Engineer's Sketch-Book, Thos. Walter Barber, 52
Life of John Davis, Clements R. Markham, 53
Brook and its Banks, Rev. J. G. Wood, 53
The Zoo, Rev. J. G. Wood, 53
The Habits of the Salmon, by Major John P. Traherne, 74
An Elementary Text-book of Geology, by W. Jerome Harrison, 75

son, 75 A Contribution to the Flora of Derbyshire, by the Rev. W.

H. Painter, 77
Science of Every-day Life, by J. A. Bower, 78
Elementary Physics, by M. R. Wright, 78
Teacher's Manual of Geography, by J. W. Redway, 78
Notes on Pinks of Western Europe, by F. N. Williams, 78 American Resorts, with Notes upon their Climate, B. W.

James, 79 Idylls of the Field, by Francis A. Knight, 79
Sixth Annual Report of the Bureau of Ethnology to the
Secretary of the Smithsonian Institution, 1884-85, 99

Traité pratique de la Thermométrie de Précision, Ch. Ed. Guillaume, Dr. Edmund J. Mills, F.R.S., 100
Fauna of British India, including Ceylon and Burma, 101
La France Préhistorique, Emile Cartailhac, 102
Experimental Science, Geo. M. Hopkins, 102

A Manual of Forestry, William Schlich, Sir D. Brandis,

F.R.S., 121
A Popular Treatise on the Winds, William Ferrel, 124
A Popular Treatise on the Winds, William Ferrel, 124

Atlas deutscher Meeresalgen, Dr. J. Reinke, 127 Die mikroskopische Beschaffenheit der Meteoriten erläutert durch photographische Abbildungen, G. Tschermak, 127 Die Structur und Zusammensetzung der Meteoreisen erläutert

durch photographische Abbildungen geätzter Schnitt-flächen, A. Brezina and E. Cohen, 127 Die Meteoritensammlung des k.k. mineralog. Hofkabinetes in

Wien, A. Brezina, 127 Introduction to Chemical Science, R. P. Williams and B. P. Lascelles, 128

The Cradle of the Aryans, Gerald H. Rendall, 128 A Monograph of the Horny Sponges, by Robert von Lendenfeld, 146

The Flora of Suffolk, by Dr. W. M. Hind, 149
Iron and Steel Manufacture, by Arthur H. Hiorns, 150
On the Creation and Physical Structure of the Earth, by J. T. Harrison, 151

Through Atolls and Islands in the Great South Sea, by F. J. Moss, 151

Notes on Sport and Ornithology, H.I.H. the late Crown

Notes on Sport and Ornithology, H.I.H. the late Crown Prince Rudolph of Austria, 169
Matabele Land and the Victoria Falls, Frank Oates, 169
Index Generum Avium, F. W. Waterhouse, 169
The Birds of Oxfordshire, O. V. Aplin, 169
The Birds of Berwickshire, Geo. Muirhead, 169
The Birds of Berwickshire, Geo. Muirhead, 169
The Viking Age, Paul B. Du Chaillu, 173
A Glossary of Anatomical, Physiological, and Biological Terms, T. Dunman, 173
A Contribution to the Physical History and Zoology of the Somers Archivelago. with an Examination of the Structure

Somers Archipelago, with an Examination of the Structure of Coral Reels, Angelo Heilprin, Dr. H. B. Guppy, 193

of Coral Reels, Angelo Heilprin, Dr. H. B. Guppy, 193
The Useful Plants of Australia, J. H. Maiden, 194
Mount Vesuvius, J. Logan Lobley, 195
Index of British Plants, Robert Turnbull, 196
Practical Observations on Agricultural Grasses and other Pasture Plants, William Wilson, 196
The State, Elements of Historical and Practical Politics, Woodrow Wilson, 196
Introductory Lessons in Quantitative Analysis, Labor Millo-

Introductory Lessons in Quantitative Analysis, John Mills

and Barker North, 197

Report on the Scientific Results of the Voyage of H.M.S.

Challenger during the Years 1873-76, under the Command of Captain George S. Nares, F.R.S., and the late Captain Frank T. Thomson, 217 Vertebrate Animals of Leicestershire and Rutland, Montagu

Browne, 220 Scientific Papers of Asa Gray, W. Botting Hemsley, F.R.S., 221

Manures and their Uses, Dr. A. B. Griffiths, 222 Histoire Naturelle des Cétacés des Mers d'Europe, P. J. Van Beneden, 223

Van Beneden, 223
Hand-book of Practical Botany for the Botanical Laboratory
and Private Student, E. Strasburger, 223
Traité d'Optique, M. E. Mascart, J. D. Everett, 224
Bibliothèque Photographique, P. Möessard, 224

Hand-book of Modern Explosives, M. Eissler, 224
Hand-book of Assaying, C. Beringer and J. J. Beringer,
Thomas Gibb, 245
The Microscope in the Brewery and Malt-house, Chas. Geo.
Mathews and Francis Edw. Lott, 246

Flower-Land, an Introduction to Botany, Robert Fisher, 247 Five Months' Fine Weather in Canada, Western U.S., and Mexico, Mrs. E. H. Carbutt, 247 A Thousand Miles on an Elephant in the Shan States, Holt

S. Hallett, 265

The Lesser Antilles, Owen J. Bulkeley, 268
A Text-book of Human Anatomy, Prof. Alex. Macalister,

F.R.S., 269
Treatise on Ordinary and Partial Differential Equations, W. W. Johnson, 270

The Land of an African Sultan, Travels in Morocco, 1887–88-89, W. B. Harris, 270

Wayside Sketches, F. Edward Hulme, 270

Hygiene, or Public Health, Louis C. Parkes, 290

Im Hochgebirge, Wanderungen von Dr. Emil Zsigmondy,

Les Animaux et les Végétaux Lumineux, Henri Gadeau de Kerville, W. A. Herdman, 293
Chemistry of Photography, R. Meldola, F.R.S., 293
The Popular Works of Johann Gottlieb Fichte, 294

Travels in France, Arthur Young, 294 East Africa and its Big Game, Captain Sir John C. Willoughby, 298

298
Einiges über die Enstehung der Korallenriffe in der Javasee und Branntweinsbai, und über neue Korallenbildung bei Krakatau, Dr. C. Ph. Sluiter, 303
Lectures on the Religion of the Semites, the Fundamental Institutions, W. Robertson Smith, 337
Algebra: an Elementary Text-book for the Higher Classes

of Secondary Schools and for Colleges, G. Chrystal, 338
The Micro-organisms of Fermentation practically considered,
Alfred Jörgensen, Prof. Percy F. Frankland, 339
An Epitome of the Synthetic Philosophy, F. Howard Collins,

The Earth and its Story, edited by Dr. Robert Broun, 341 Steam, William Ripper, 341

Australia Twice Traversed, Ernest Giles, 341 New Zealand for the Emigrant, Invalid, and Tourist, John Murray Moore, 342

Report on the Scientific Results of the Exploring Voyage of H.M.S. Challenger, 361
The Human Foot, Thos. S. Ellis, 365
Das australische Florenelement in Europa, Dr. Constantin

Freiherr von Ettingshausen, 365
Ts the Copernican System of Astronomy True?, W. S.

as the Copernican System of Astronomy True, in S. Cassedy, 366

Naturalistic Photography, P. H. Emerson, 366

A Dictionary of Applied Chemistry, Prof. T. E. Thorpe, F.R.S., Vol. I., 387

Oates's Ornithology of India, 388

The Nests and Eggs of Indian Birds, by Allan O. Hume, 388

Die Arten der Gattung Ephedra, by Dr. Otto Stapf, 390

Contained Mechanism by J. Spottiswoode Wilson, 390 Geological Mechanism, by J. Spottiswoode Wilson, 390

The Scenery of the Heavens, by J. E. Gore, 391 A Trip to the Eastern Caucasus, by the Hon. John Aber-

A Trip to the Eastern Caucasus, by the cromby, 391
Gimpses of Animal Life, W. Jones, 409
Toilers in the Sea, M. C. Cooke, 409
Les Industries des Animaux, F. Houssay, 409
A General Formula for the Uniform Flow of Water in Rivers and other Channels, E. Ganguillet and W. R. Kutter, 411
Der Kompass an Bord, Dr. Neumayer, 412
Library Reference Atlas of the World, John Bartholomew, 413
The Bala Volcanic Series of Caernaryonshire and Associated Rocks; being the Sedgwick Prize Essay for 1888, Alfred Harker, 414

Ethnographische Beiträge zur Kenntniss des Karolinen Archi-pels, J. S. Kubary, 433 Railways of England, Railways of Scotland, W. M. Acworth,

434
Diseases of Plants, Prof. H. Marshall Ward, F.R.S., 436
The Physician as Naturalist, W. T. Gairdner, 436

Materials for a Flora of the Malayan Peninsula, Dr. Geo.

King, F.R.S., 437
Report of the Scientific Results of the Voyage of H.M.S.

Challenger during the Years 1873-76, 443

A Naturalist in North Celebes, Sydney J. Hickson, Dr. F.

H. H. Guillemard, 457

The Elastical Researches of Barré de Saint-Venant, Prof. A. G. Greenhill, F.R.S., 458 Hues's Treatise on the Globes (1592), 459 The Psychology of Attention, Th. Ribot, 460

Handleiding tot de Kennis der Flora van Nederlandsch Indië, 461

401
The Elements of Laboratory Work, A. G. Earl, 461
Magnetism and Electricity, Prof. Jamieson, 461
Astronomy with an Opera Glass, Garrett P. Serviss, 462
Wissenschaftliche Resultate der von N. M. Przewalski nach

Wissenschaftliche Resultate der von N. M. Przewalski nach Central-Asien unternommenen Reisen, 468 Dr. A. B. Meyer's Celebes Photographs, 471 Geologische Uebersichtskarte der Alpen, Dr. Franz Noë, Prof. T. G. Bonney, F.R.S., 483 Old Age, Geo. M. Humphrey, 484 Elements of Astronomy, Prof. C. A. Young, 485 Physiology of Bodily Exercise, Dr. Fernand Lagrange, 485 Boilers, Marine and Land, T. W. Traill, 486 History and Pathology of Vaccination, E. M. Crookshank, Dr. Robert Corv. 486

Dr. Robert Cory, 486
Cave Fauna of North America, with Remarks on the Anatomy of the Brain, and Origin of Blind Species, A. S.

Packard, 507
A Treatise on Linear Differential Equations, Thomas Craig, 508

Bacteria of Asiatic Cholera, Dr. E. Klein, 509
Manuel de l'Analyse des Vins, Ernest Barillot, 510
British Journal Photographic Almanac, 1890, 510
Four-Figure Mathematical Tables, J. T. Bottomley, F.R.S.,

510 New Lights from Solar Eclipses, William M. Page, William E. Plummer, 529 The Evolution of Sex, Prof. Patrick Geddes and J. Arthur

Thomson, 531

Thomson, 531
Geology of the Quicksilver Deposits of the Pacific Slope, G. F. Becker, 532
Illustrations of some of the Grasses of the Southern Punjab, being Photo-lithographs of some of the Principal Grasses found at Hissar, William Coldstream, 533

Elementary Dynamics of Particles and Solids, W. M. Hicks,

F.R.S., 534

Catalogue of the Fossil Reptilia and Amphibia in British Museum (Natural History), Richard Lydekker, 534
The Growth of Capital, by Robert Giffen, 553
Contributions to the Fauna of Mergui and its Archipelago,

556 How to know Grasses by their Leaves, by A. N. M'Alpine,

Facsimile Atlas to the Early History of Cartography, with Reproductions of the most Important Maps printed in the Fifteenth and Sixteenth Centuries, by A. E. Nordenskiöld, 558

Light and Heat, by the Rev. F. W. Aveling, 558
Warren's Table and Formula Book, by the Rev. Isaac

Warren, 558 Short Lectures to Electrical Artisans, J. A. Fleming, 561 Absolute Measurements in Electricity and Magnetism, Andrew

Gray, 561

Gray, 561
Theory and Practice of Absolute Measurements in Electricity and Magnetism, Andrew Gray, 561
Electricity in Modern Life, G. W. de Tunzelmann, 561
Cultivated Oranges and Lemons of India and Ceylon, Dr. E. Bonavia, C. B. Clarke, F.R.S., 579
A Naturalist among the Head-hunters, C. M. Woodford,

502 Recherches sur les Tremblements de Terre, Jules Girard, 583 La Photographie à la Lumière du Magnésium, Dr. J. M. Eder, translated by H. Gauthier-Villars, 584 Un Viaggio a Nias, Elio Modigliani, Prof. Giglioli, 587

On Vlaggio a Mas, End Modigiani, Froi. Gignoi, 567 Revue d'Anthropologie, 357 Revue Générale des Sciences Pures et Appliquées, 160 Reymond (Dr. René du Bois), on the Striated Muscles of the Tench, 95 Rhizocarps, Fossil: Sir J. Wm. Dawson, F.R.S., 10; Alfred

W. Bennett, 154
Ribot (Th.), Psychology of Attention, 460
Riccò (Prof.), Sun-Spot of June, July, and August, 1889, 115
Richardson (Dr. A.), Action of Light on Moist Oxygen, 142
Righi (Prof.), New Method of Measuring Differences of Potential of Contact, 18

Rings of Saturn, Stability of the, O. Callandreau, 548 Ripper (William), Steam, 341 Rivista Scientifico-Industriale, 380

Road at Sea, Rule of the, Admiral Colomb, 515 Roberts (A. Ernest), the Relation of the Soil to Tropical Diseases, 31

Roberts (Isaac), a Photographic Method for Determining Varia-

Roberts (Isaac), a Indegraph and bility in Stars, 332
Roberts-Austen (Prof. W. C., F.R.S.): on the Hardening and Tempering of Steel, 11, 32; the Relation between Atomic Volumes of Elements present in Iron and their Influence on its Molecular Structure, 420 Robinson (H. H.), Frangulin, 262

Robinson (H. H.), Frangulin, 262
Roborovsky (Colonel), Expedition in Central Asia, 234; Discovery of New Pass from Nia to Tibet by, 327
Rock-Sepulchre in Morea, Vaphio, S. Reinach, 500
Rock-Specimens Collected in Oceanic Islands, Prof. A. Renard,

363 Rocks, the Bala Volcanic Series of Caernarvonshire and Associated, being the Sedgwick Prize Essay for 1888, Alfred

Harker, 414 Rocks, Chemical and Physical Studies in the Metamorphism of,

Rev. A. Irving, 49
"Rollers," the, of Ascension and St. Helena, Prof. Cleveland

Abbe, 585
Romanes (Prof. Geo. J., F.R.S.): Darwinism, 59; Galls, 80, 174, 369; Panmixia, 437, 511, 585; Before and After Darwin, 524; Like to Like, a Fundamental Principle in Bionomics, 535

Rome: Earthquake at, 401; Solar Observations at, Prof.

Rome: Earthquake at, 401; Solar Observations at, 110. Tacchini, 595

Rorqual musculus Stranded in Médoc District, 113

Roscoe (Sir Henry, M.P., F.R.S.): the City Guilds and Technical Education, 160; on the Future of our Technical Education, 183; Technical Education Bill, 493; a Dictionary of Applied Chemistry by Prof. T. E. Thorpe, F.R.S., Vol. 1.

387 Rose (T. Kirke), the New Assistant Surveyor at Royal Mint,

Rosenberger (Otto), Death of, 324

Rotation of Mercury, on the, Signor Schiaparelli, 257
Roth (Hy. Ling): a Surviving Tasmanian Aborigine, 105
Roth (Herr), on the South American Pampas Formation, 231
Roumania, Meteorological Institute of, 181
Roux (G.), Morphology and Biology of Oidium albicans, 72
Rowley (F. R.), on a Mite of the Genus Tetranychus found
Infesting Lime-trees in the Leicester Museum Grounds, 31

Royal Botanic Society, 448, 494
Royal Geographical Society, 351; Honours for 1890, 571
Royal Horticultural Society, 182, 282
Royal Institution Lecture Arrangements, 136, 181, 256, 426,

519, 545 Royal Irish Academy, 469 Royal Meteorological Society, 93, 212, 301, 358, 406, 503, 598;

Royal Meteorological Society, 93, 212, 301, 358, 406, 503, 598; Exhibition of the, 491
Royal Microscopical Society, 93, 191, 263, 335, 371, 550
Royal Society, 17, 118, 140, 166, 189, 212, 237, 287, 309, 332, 357, 380, 430, 477, 501, 525, 550, 573, 598; Medals, 41; Anniversary Meeting. 84, 116, 234; Election of Foreign Members of, 135; Key to the Royal Society Catalogue, James McConnel, 342, 391, 418; the Government Grant, 347; the Royal Society Proceedings, 400
Royal Society of New South Wales, 311; Prizes offered by, 240

349

Royal Society of Tasmania, 43
Royal Victoria Hall and Morley Memorial College, 343 Rubens (Dr.), Use of Bolometer for Observing Electrical Radiations of Hertz, 504

Rücker (Prof. Arthur W., F.R.S.): Physical Properties of Water, 416; and Prof. T. E. Thorpe, F.R.S., Magnetic Surveys of Special Districts in the British Isles, 598 Rudge (W. A.), Specific Inductive Capacity, 10 Ruhemann (Dr. S.), Action of Chloroform and Alcoholic Potash

Ruhemann (Dr. S.), Action of Chloroform and Alcoholic Potash on Hydrazines, 263
Rule of the Road at Sea, Admiral Colomb, 515
Russell (Hon. F. A. R.), the Causes and Character of Haze, 60
Russell (H. C.), Meteorology of New South Wales, 113
Russia; Russian Botanical Appointments, 42; Geography in
Russia, Baron Kaulbars, 208; Russian Geographical Society,
and the Black Sea, 348; Russian Academy of Sciences, 302;
Eighth Congress of Russian Naturalists, 356; a Uniform
System of Russian Transliteration, 396; Chas. E. Groves,
F.R.S., 534; W. F. Kirby, 535; Mammoth Skeleton in
Russia, 448; New Russian Natural Science Review, 469
Rutley (Frank), Composite Spherulites in Obsidian from Hot

Rutley (Frank), Composite Spherulites in Obsidian from Hot Springs near Little Lake, California, 551

Sacchiero (G. B.), the Chin Tribes, North Burma, 375 St. Andrews, Bequest of £100,000 to the University of, 41 St. Helena: the Native Ebony of, Morris, 519; the "Rollers" of, Prof. Cleveland Abbe, 585 St. Louis Botanic Garden, the Shaw Bequest for the Endow-

ment of the, 324 St. Louis, Earthquake at, 18

St. Petersburg Academy of Sciences, 495
St. Petersburg Problem, the, Sydney Lupton, 165
Saint-Venant (Barré de), the Elastical Researches of, Prof. A.

G. Greenhill, F.R.S., 458 Salad-Plants, H. de Vilmorin, 494 Salet (G.), the Blue Flame of Common Salt, 383

Salisbury (the Marquis of): on Electrical Science, 21; on Free Education, 84 Salmon, the Habits of the, Major John P. Traherne, 74

Salmon in Tasmania, Acclimatized, 43

Salt, Common, Experiments upon Simultaneous Production of Pure Crystals of Sodium Carbonate and Chlorine from, Dr.

Hempel, 19 Salvadori (Count), Agguinte alla Ornitologia della Papuasia e delle Molucche, 85

Sanitary Assurance Association, 136, 401

Sanitary Institute, 302

Sanitary Institute, 302
Saporta (G. de), some Provençal Tree-Hybrids, 23
Sardines in Moray Firth, Prof. Ewart, 282
Satellite of Algol, W. H. S. Monck, 198
Saturn: Mass of, Asaph Hall, 429; Stability of the Rings of, O. Callandreau, 548

Savelief (R.), Actinometric Observations (1888-89) at, 359
Scale: Sir G. Shuckburgh's Unit of Length of a Standard,
General J. T. Walker, R.E., F.R.S., 381; Shuckburgh Scale
and Kater Pendulum, O. H. Tittmann, 538

Scenery of the Heavens, J. E. Gore, 391 Schafhäutl (Dr. von), Death and Obituary Notice of, 448 Scheiner (Dr.), some Photographic Star Spectra, 163

Schiaparelli (Signor), on the Rotation of Mercury, 257 Schick (Herr), Troglodytic Remains in Jerusalem, 284

Schleinitz (Admiral von), the North Coast of New Guinea, 21 Schlich (Dr. William): a Manual of Forestry, Sir D. Brandis, F.R.S., 121; Forestry in India, 470 Schlessing, Fils (Th.): Air in the Soil, 23; the Fermentation of Stable Manure, 143; Absorption of Atmospheric Ammonia

of Soils, 479
Schneider (Dr.), Iron in the Animal Organism, 24
Schools, Technical Education in Elementary, 356
Schorr (Dr. R.): Comet Swift (f 1889, November 17), 139; on

the Star System & Scorpii, 374
Schuster (Dr., F.R.S.), Total Solar Eclipse of 1886, 327
Science, Australasian Association for the Advancement of, Prof. Orme Masson, 441

Science Collections at South Kensington, the Housing of the, 399, 409

399, 409
Science in Dutch East Indies, 547
Science at Eton, Lieut. General Tennant, F.R.S., 587
Science of Every-day Life, J. A. Bower, 78
Science, Experimental, George M. Hopkins, 102
Science and the Future Indian Civil Service Examinations, 25; Henry Palin Gurney, 53

Science and Law, 399 Science and the New English and Scotch Codes, 385 Scientific Education in China, the Question of Language, 162

Scientific Literature, Native Indian, 569 Scientific Missions, French, under the Old Monarchy, Dr.

Hamy, 427 Sclater (Dr. P. L., F.R.S.): Argentine Ornithology, R. Bowdler Sharpe, 7; la Pietra Papale, 31; African Monkeys

Bowdler Sharpe, 7; la Pietra Papale, 31; African Monkeys in the West Indies, 368
Scorpii, on the Star System & Dr. Schorr, 374
Scotland: Railways of, W. M. Acworth, 434; certain Devonian Plants from, Sir J. W. Dawson, F.R.S., 537
Scott (R. H., F.R.S.), Variability of Temperature of British Isles, 1859-83, 550
Scottish Journal of Natural History, 373
Scottish Meteorological Society, 518
Scouller (William), Rainbow due to Sunlight reflected from the Sea. 221

Sea. 271

Sea, 271
Sea, Rainbow due to Sunlight reflected from the, Sir William Thomson, F.R.S., 271; William Scouller, 271
Sea, Rule of the Road at, Admiral Colomb, 515
Sea, Toilers in the, M. C. Cooke, 409
Seal (W. P.), the Management of Aquaria, 18
Sedgwick and Murchison, Cambrian and Silurian, Prof. James

Sedgwick and Murchison, Cambrian and Shurian, Prof. James D. Dana, 421
Sedgwick Prize Essay for 1888, 414
Seismology: Record of British Earthquakes, Charles Davison, 9; the Earthquake of Tokio, April 18, 1889, Prof. Cargill G. Knott, 32; Earthquake in Servia, 113; Brassart Brothers' New Seismoscopes, 137; British Earthquakes, William White, 202, 248; Atmospheric Circulation, A. Buchan, 363; Recherites Sur les Tremblements de Terre, Jules Girard, 583

Selenite, Salts of, M. Boutzoureano on, 87 Selenium: the Chlorides of, M. Chabrié, 284; Compounds of, Prof. William Ramsay, F.R.S., 343

Self-luminous Clouds: Geo. F. Burder, 198; C. E. Stromeyer,

Semites, the Cradle of the, Dr. Brinton, Prof. Jastrow, 569 Semites, Lectures on the Religion of the, Prof. W. Robertson

Smith, 337 September, Chiff-Chaff Singing in, F. M. Burton, 298 Severn Valley Field Club, 86

Servia, Earthquake in, 113 Serviss (Garrett P.), Astronomy with an Opera Glass, 462 Sex, the Evolution of: M. S. Pembrey, 199; Dr. A. B. Meyer, 272; Prof. Patrick Geddes and Arthur Thomson, 531 Shan States, a Thousand Miles on an Elephant in, Holt S.

Hallett, 265 Sharp (Dr. Davis) appointed Curator in Zoology at Cambridge, 324

324
Sharpe (R. Bowdler): Argentine Ornithology, P. L. Sclater, F.R.S., and W. H. Hudson, 7; Notes on Sport and Ornithology, H.I.H. Prince Rudolph of Austria, 169; Matabele Land and the Victoria Falls, Frank Oates, 169; Index Generum Avium, F. H. Waterhouse, 169; the Birds of Oxfordshire, O. V. Aplin, 169; the Birds of Berwickshire, Geo. Muirhead, 169; the Birds in my Garden, W. T. Greene, 169; Oates's Ornithology of India, Vol. I., 388; Hume's Nests and Eggs of Indian Birds, Vol. I., 388
Shaw Bequest for Endowment of St. Louis Botanic Garden, 324
Sheep-farming in Australia, Prof. Wallace, 113
Shell, Deformation of an Elastic, Prof. Horace Lamb, F.R.S.,

Sherrington (C. S.), Outlying Nerve-cells in Mammalian Spinal

Cord, 358 Shining Night Clouds, Robert B. White, 369 Ships, Steel, Leak-stopping in, Captain C. C. P. Fitzgerald, Ships, Steel, R.N., 516

Ships, the Strength of, Prof. P. Jenkins, 515 Shooting-stars, the Origin of, 92 Shore (T. W.), Characteristic Survivals of Celts in Hampshire,

400
Shot, on certain Approximate Formulæ for Calculating the Trajectories of, Prof. J. C. Adams, 258
Shrubs, Evergreen, in Manchester, Proposed Planting of, 401
Shuckburgh Scale and Kater Pendulum, O. H. Tittmann, 538
Shufeldt (R. W.), Craniology of Heloderma suspectum, the Poisonous Lizard of South-West United States, 181
Shufeldt (Dr. P. W.) Work on Avign. Academy, 544

Shufeldt (Dr. R. W.), Work on Avian Anatomy, 594

Shufeldt (Dr. R. W.), Work on Avian Anatomy, 594
Siam, Life in, 265
Siberia, Limits of Ever-frozen Soil in, Yatchevsky, 472
Sidgreaves (Rev. W.), Melde's Vibrating Strings, 355
Sieber (Dr. J.), Diethylene Diamine, 428
Simaschko (Prof.), the Méguéia Meteorite, 472
Sinclair (W. E.), Flint Remains in Kolaba District, 114
Singapore, Noxious Grass (Lalang) at, 182
Skin-Colour in Arctie Voyagers, Causes of Change of, Holmoren, 546

gren, 546 Skin, Electric Currents from Mental Excitation in, Herr

Skin, Electric Currents from Mental Excitation and Tarchenoff, 232
Sluiter (Dr. C. Ph.), the Coral Reefs of the Java Sea and its Vicinity, Dr. H. B. Guppy, 300
Smith (Prof. C. Michie): the Green Flash at Sunset, 538; a New Green Vegetable Colouring-Matter, 573; Determination, by Measurement of Ripples, of Surface Tensions of Liquids,

Smith (Prof. W. Robertson), Lectures on the Religion of the

Semites, 337
Smokeless Explosives, Sir Frederic Abel, F.R.S., 328, 352
Smolenski (Dr.), the Suspected Connection between Influenza and Cholera Epidemics, 282
Smyth (Robert Brough), Death of, 112

Snake and Fish, Herr Fischer-Sigwart, 162 Snake-bite in Ratnagherry District, Mortality from, Vidal, 325

Society of Arts, 42
Society for Psychical Research, 17
Sohncke (Prof.), Cause of Blue-Green Flame Phenomenon of Sunset at Sea, 495

Soil, the Relation of the, to Tropical Diseases, A. Ernest Roberts, 31 Soils, Sources of Nitrogen in, Prof. John Wrightson, 286

Solar Activity in 1889, 522 Solar Corona, Mathematical Study of the, Prof. F. H. Bigelow,

Solar Eclipse of 1886, Total, 88; Dr. Schuster, F.R.S., 327 Solar Eclipse, Total, of December 22, 1889, M. A. De La Baume Pluvinel, 428 Solar Eclipses, New Light from, William M. Page, William

E. Plummer, 529
Solar Halos and Parhelia, 330; J. Lovell, 560
Solar and the Lunar Spectrum, the, Prof. Langley, 450
Solar Observations at Rome, Prof. Tacchini, 595
Solar Spots and Prominences, Prof. Tacchini, 233

Solar Spectrum, Maximum Light-Intensity of the, Dr. Men-

garini, 374 Solar and Stellar Motions, Prof. J. R. Eastman, 351, 392. See also Sun

Sollas (Prof., F.R.S.), Mica in Mourne Mountain Geodes, 469 Solomon Islands: Further Explorations of, C. M. Woodford, 403; a Naturalist among the Head-hunters, C. M. Woodford,

Sorbite, Vincent and Delachanal, 23

Sorbotte, Vincent and Delactisana, 25 Sorbonne, Mathematical Teaching at, Prof. Ch. Hermite, 597 Sorby (H. C., F.R.S.), on Meteorites, 307 Sormani (Prof. G.), Antidotes and Treatment of Tetanus, 212 Sound, Propagation of, MM. Violle and Vautier, 359

South American Pampas, Mirage in the, W. Larden, 69 South Kensington, Science Collections at, the Housing of the,

399, 409
South Sea, Through Atolls and Islands in the, F. J. Moss, 151
Souza (J. A. de), Death of, 135
Specific Inductive Capacity: W. A. Rudge, 10; Prof. Oliver

Souza (J. A. de), Death of, 135
Specific Inductive Capacity: W. A. Rudge, 10; Prof. Oliver
J. Lodge, F. R.S., 30
Spectrum Analysis: Objects for the Spectroscope, 44, 68, 87,
114, 138, 163, 183, 210, 232, 257, 285, 304, 326, 350, 374,
402, 428, 449, 472, 496, 521, 548, 571, 595; Photography
of the Red End of the Spectrum, Colonel J. Waterhouse, 67;
some Photographic Star Spectra, Dr. Scheiner, 163; Spectrum of Algol, Prof. Vogel, 164; Colour Spectrum of
Fluorine, H. Moissan, 214; Spectrum of a Metallic Prominence, 233; Spectrum of ζ Ursæ Majoris, on the, Prof.
Pickering, 285; Spectroscopic Observations of Algol, Prof.
Vogel, 285; New Fluorescent Materials, Lecoq de Boisbaudran, 287; Maxwell Hall on the Spectrum of the Zodiacal
Light, 351, 402; Spectrum of Borelly's Comet (g 1889), 374;
Maximum Light-Intensity of the Solar Spectrum, Dr. Mengarini, 374; Spectra of δ and μ Centauri, 374; Blue Flame
of Common Salt, G. Salet, 383; Spectroscopic Observations
of the Zodiacal Light, Λ. Fowler, 402; the Solar and the
Lunar Spectrum, Prof. Langley, 450; Kirchoff's Law and
Gaseous Radiation, Dr. E. Pringsheim, 480; the Spectrum
of Subchloride of Copper, Prof. A. S. Herschel, F.R.S.,
513; Bright Lines in Stellar Spectra, Rev. J. E. Espin, 549;
Fundamental Common Property of two Kinds of Spectra,
Lines and Bands, Distinct Characteristics of each of the
Classes, Periodic Variations to Three Parameters, H. Deslandres, 576; Spectrum of Aqueous Vapour, Chas. S. Cook,
598
Spencer (Herbert): Inheritance of Acquired Characters. 414: 598

Spencer (Herbert): Inheritance of Acquired Characters, 414;

Nebular Hypothesis, 450; Panmixia, 511 Spencer (Perceval), Successful Use of Asbestos Hot-air Balloon

Spencer (Perceval), Successful Use of Aspestos Hot-air Bandon in India, 325
Spitaler (Dr. R.), Temperature "Anomalies," 303
Spitta (E. J.), a New Wedge Photometer, 287
Sponges: Discovery of Sponge-bank near Lampedusa, 284; the Horny Sponges, Robert von Lendenfeld, 146; Sponges attached to Crabs, Dr. R. von Lendenfeld, 317; Physiology

S

S

S

Sy Sy

Ta

Ta

Ta Tas

attached to Crabs, Dr. R. von Lendenfeld, 317; Physiology of Sponges, Dr. Lendenfeld, 520 Sporer (Prof.), Sun-spots in 1889, 383
Spots, Solar, and Prominences, Prof. Tacchini, 233
Stability of the Rings of Saturn, O. Callandreau, 548
Stalactite Cave discovered in Westphalia, 113
Stalybridge Mechanics' Institute, Chemical Laboratory at, 85
Stanley (H. M.), his Explorations in Africa, 20, 73, 111
Stapf (Dr. Otto), Die Arten der Gattung Ephedra, 390
Stapley (A. M.), the Composition of the Chemical Elements, 56
Stars: Double, Measurements of S. W. Burnham, E. E. Barnard, 19; New Double Stars, Miss A. M. Clerke, 132; Star nard, 19; New Double Stars, Miss A. M. Clerke, 132; Star Distances, Miss A. M. Clerke, 81; New Variable Stars in Hydra, 88; Y Cygni, 88; Period of U Coronæ, S. C. Chandler, 163; in Cluster G.C. 3636, Prof. Pickering, 183; Observations of some Suspected Variables, Rev. John G. Hagen, 233; New Short-period Variable in Ophiuchus, 403; New Variable in Cælum, 571; the Origin of Shooting-stars, 92; Photographic Star Spectra, 115; Dr. Peters's Catalogue, 210; Star-Land, Sir Robert S. Ball, F.R.S., 315; Star System ξ Scorpii, Dr. Schorr, 374; the Distance of the Stars, Dr. W. H. S. Monck, 392; Observations of ζ Ursæ Majoris and β Aurigæ, 403; Melbourne Star Catalogue, 522; Discovery of Asteroids, Dr. Palisa, 522; M. Charlois, 522 State, the, Elements of Historical and Practical Politics, Woodrow Wilson, 196
Steam, Electrification of, Shelford Bidwell, F.R.S., 213

Steam, Electrification of, Shelford Bidwell, F.R.S., 213
Steam, William Ripper, 341
Steam-engine Design, Jay M. Whitham, 29
Steam-ships, the Steering of, A. B. Brown, 516
Stearns (R. E. C.): Effect of Music on Animals, 470; on a

Stearns (Ř. E. C.): Effect of Music on Animais, 470; on a Canary, 593
Stebbing (Rev. T. R. R.), the Moon in London, 586
Steel; on the Hardening and Tempering of, Prof. W. C. Roberts-Austen, F.R.S., 11, 32; Behaviour of, under Mechanical Stress, C. H. Carus-Wilson, 213; Physical Properties of Nickel Steel, Dr. J. Hopkinson, F.R.S., 332; the Rupture by Longitudinal Stress of, C. A. Carus-Wilson, 574; Steel and Iron Manufacture, Arthur H. Hiorns, 150
Stellar Parallax by Means of Photography, Prof. Pritchard, 19
Stellar Spectra, Bright Lines in, Rev. J. E. Espin, 549

Stieltjes (M.), the Exponential Function, 382

Stiffe (Captain), Glaciation of Valleys in Kashmir Himalayas,

Stockholm, Royal Academy of Sciences, 24, 168, 192, 288, 408, 576, 600

Story, the Earth and its, edited by Dr. Robert Brown, 341 Story of a Tinder-Box, Chas. M. Tidy, 30

Strabismus, H. Parinaud, 72
Strabismus, H. Parinaud, 72
Strabismus, H. Rarinaud, 72
Strabis Settlements, Meteorology of, 114
Strasburger (E.), Hand-book of Practical Botany for the Botanical Laboratory and Private Student, 223 Stricker (Prof.), New Electrical Lantern, 593

Strickland (Father, S.J.), Last Days of Father Perry, F.R.S., 301 Strings, Vibrating, Melde's, Rev. W. Sidgreaves, 355 Strips, the Behaviour of Twisted, Prof. J. Perry, F.R.S., 47 Stromeyer (C. E.): Self-luminous Clouds, 225; the Evaporative Efficiency of Boilers, 516; Structure of Jupiter's Belt 3, III.,

Dr. Terby, 45
Struggle for Existence in Plants, Prof. Walter Gardiner, 90
Stuart (Prof.), Proposed Address to, on his Resignation, 426
Students, Foreign, in Paris, 520
Subchloride of Copper, the Spectrum of, Prof. A. S. Herschel,

F.R.S., 513
Sub-oceanic Crust, Physics of the, Rev. Osmond Fisher, A. J.
Jukes-Browne, 53; J. Starkie Gardner, 103
Subsidence at Northwich, 230
Suffolk: Flora of, by Dr. W. M. Hind, 149; Dr. Wheelton

Hind on the Geology of, 149 Sugar losing its Attractions for Lepidoptera, Joseph Anderson, 349 Sugar-Cane: Disease at St. Vincent, 372; Seeding of, D. Morris,

478

Sulphur, Crystalline Allotropic Forms of, Dr. Muthmann, 449 Sumpner (Dr. W. E.), Galvanometers, 310, 381 Sun's Way, Apex of the, Lewis Boss, 548

Sunlight reflected from the Sea, Rainbow due to, Sir William

Thomson, F. R.S., 271; W. Scouller, 271
Sunset, the Green Flash at, C. Michie Smith, 538
Sunset at Sea, Cause of Blue-green Flame Phenomenon of, Prof. Solncke, 495
Sun-spots: Minimum Sun-spot Period, M. Bruguière, 68; Sun-spot Period, M. Bruguière,

spot of June, July, and August, 1889, Prof. Riccò, 115; Sunspots and Prominences, Prof. Tacchini, 233; Sunspot in High Latitudes, G. Dierckx, 472; Sunspots in High Southern Latitudes, Rev. S. J. Perry, F.R.S., 88; Observations of Sunspots made at Lyons Observatory in 1889, Em.

Marchand, 599. See also Solar
Survey, the Indian, 230
Sutherland (Geo.), Earth-Currents and the Occurrence of Gold,

Swift (Dr. Lewis): a New Comet discovered by, 69; Comet Swift (f 1889, November 17), Dr. Zelbr, 115, 233; Dr. R. Schorr, 139; Dr. Lamp, 233, 429; Swift's Comet (V. 1880), Orbit of, 257; the Cluster G.C. 1420 and the Nebula N.G.C. 2237, 285

Sydney, Royal Society of New South Wales, 96 Symons (G. J., F. R. S.), Remarkable Hailstones, 134

Synoptical Tables of Organic and Inorganic Chemistry, Clement

J. Leaper, 510 Synthetic Philosophy, an Epitome of the, F. Howard Collins,

Systems of Russian Transliteration, Chas. E. Groves, F.R.S., 534; W. F. Kirby, 535

Table and Formula Book, Rev. Isaac Warren, 558

Table and Formula Book, Rev. Isaac Warren, 558
 Tacchini (Prof.): Corona of January I, 1889, 139; Solar Spots and Prominences, 233; Solar Observations at Rome, 595
 Taczanowski (Dr. L.), Death of, 324
 Tait (Prof. P. G.): Portrait Memorial of, 135; Glissette of Hyperbola, 214; Compressibility of Water, 361; Physical Properties of Water, 416
 Tannin, Nessler's Ammonia Test as a Micro-Chemical Reagent for Spacer More 1887.

for, Spencer Moore, 585
Tarchenoff (Herr), Electric Currents in Skin from Mental

Excitation, 232 Tasmania: Change in Character of Acclimatized Salmon in, 43;

the Last Living Aboriginal of, James Barnard, 43; Destruc-tion of Opposum in, 304; a Surviving Tasmanian Aborigine, Hy. Ling Roth, 105 Taste, Sense of, Dr. Goldscheider's Researches on, 600

Tavernier (Jean Baptiste), Travels in India, 313 Taxine, a New Alkaloid from Leaves, &c., of Yew Tree, Drs. Hilger and Brande, 496

Teacher's Manual of Geography, J. W. Redway, 78
Technical Education: Conference on, at Manchester, 84;
Dundee Association, 113; on the Future of our Technical
Education, Sir Henry Roscoe, M.P., F.R.S., 183; Technical
Education in Elementary Schools, 356; the New Codes,
English and Scotch, 385, 505; Technical Education in Central

India, 470
Teeth in the Ornithorhynchus, Who Discovered the, C. Hart Merriam, 11, 151; Prof. W. H. Flower, F.R.S., 30, 151; Prof. Oswald H. Latter, 30, 174

Telephone, the Pulsion Mechanical, 65 Telephone Transmitter, Carbon Deposit in Blake, F. B. Hawes, 477 Telescope, the Maintaining and Working of the Great Newall,

357

Tempering of Steel, on the Hardening and, Prof. W. C. Roberts-F.R.S., 11, 32

Ten and Tenth Notation, B. A. Muirhead, 344
Tench, the Striated Muscles of, Dr. René du Bois-Reymond on,

Tennant (Lieut.-General, F.R.S.), Science at Eton, 587 Tension of Recently Formed Liquid Surfaces, Lord Rayleigh,

Terby (Dr.), the Structure of Jupiter's Belt 3, III., 45 Terminology, the Revised, in Cryptogamic Botany, Alfred W.

Bennett, 225 Tetanus, Antidote and Treatment of, Prof. G. Sormani, 212 Tetranychus, on a Mite of the Genus, found Infesting Lime

Trees in the Leicester Museum Grounds, F. R. Rowley, 31 Texas, Great Find of Rare Minerals of Yttrium and Thorium

Texas, Great Find of Rare Minerals of Yttrium and Thorium Groups in, 162
Textiles, Prehistoric, Herr Buschan, 182
Textural Elements, the Longevity of, particularly in Dentine and Bone, John Cleland, 392
Thames Estuary, the, Captain Tizard, R.N., 539
Theory of Least Squares, a Formula in the, D. Wetterhan, 394
Thermal Conductivity in Flints, a Natural Evidence of High, Prof. A. S. Herschel, F.R.S., 175
Thermometer, Electric, Herr Siegefeld, 43
Thermometers, Aspiration, Dr. Assmann's, 239
Thermometry, Exact: Dr. Sydney Young, 152, 271, 488; Herbert Tomlinson, F.R.S., 198; Dr. Edmund J. Mills, F.R.S., 227, 538

227, 538 Thermometry: Traité pratique de la Thermométrie de Pré-cision, Ch. Ed. Guillaume, Dr. Edmund J. Mills, F.R.S.,

Thomas (Oldfield), a Milk Dentition in Orycteropus, 309

Thomas (Oldneid), a sink Dendition in Orycleropus, 309
Thomas (R. Haig), Panmixia, 585
Thompson (Prof. Silvanus P.): Geometrical Optics, II., 213;
Electric Splashes, 309; Bertrand's Refractometer, 526;
Bertrand's Idiocyclophanous Prism, 574
Thomson (Dr. Arthur): the Veddahs of Ceylon, 303; Prof.

Patrick Geddes and, Evolution of Sex, 531

Thomson (Sir William, F.R.S.): Rainbow due to Sunlight reflected from the Sea, 271; Eight Rainbows seen at the same time, 316; Electrostatic Stress, 358
Thoroddsen's Explorations in Iceland, 165

Thorpe (Prof. T. E., F.R.S.): Photometric Intensity of Coronal Light, 139; Frangulin, 262; a Dictionary of Applied Chemistry, Vol. I., Sir H. E. Roscoe, M.P., F.R.S., 387; the Glow of Phosphorus, 523; and Prof. A. W. Rücker, F.R.S., on Magnetic Surveys of Special Districts in the British Isles, 598

Thought and Breathing: R. Barrett Pope, 297; Prof. F. Max Müller, 317; Rev. W. Clement Ley, 317; Mrs. J. C. Murray-Aynsley, 441 Thresh (Dr.), New Method of Estimating Oxygen dissolved in

Water, 335 Thuillier and Waterhouse's Conversion Tables for Metric

System, 66 Thunderstorms in England and Wales, 93

Thury (Prof.), Changes in Lunar Craters, 183 Tibet, Discovery by Colonel Pevtsoff and M. Roborovsky of New

Pass from Nia to, 327 Tidal and Levelling Operations in India, 140 Tiddemann (R. H.), Brilliant Meteors, 105

Tidy (Chas. M.), the Story of a Tinder-box, 30

Tietkens's Explorations in Central Australia, 286

Tilden (Prof. W. A., F.R.S.), Crystalline Substances obtained

from Fruits of various Species of Citrus, 527 Time and Tide, a Romance of the Moon, Sir Robert S. Ball,

F.R.S., 30 Timehri, Journal of Royal Agricultural and Commercial Society of British Guiana, 549

of British Guana, 349
Tinder-box, the Story of a, Chas. M. Tidy, 30
Ti-serand (F.): Nuclei of Great Comet II. of 1882, 358; the
Great Comet of 1882, 522; the Movement of Planets, 406
Titanotherium in the British Museum, 346
Titchener (E. B.): Protective Coloration of Eggs, 129; the

Cape Weasel, 394
Tittmann (O. H.), Shuckburgh Scale and Kater Pendulum,

Titimann (G. A.),
538
Tizard (Captain, R.N.), the Thames Estuary, 539
Todd (Prof. David P.), Total Eclipse, 379
Togoland, German, Climate of, Dr. von Danckelman, 545
Toilers in the Sea, M. C. Cooke, 409
Tokio: the Earthquake of, April 18, 1889, Prof. Cargill G.
Knott, 32; Redetermination of Latitude in, Watanabe,

Tomlinson (Herbert, F.R.S.): Effect of Repeated Heating and Cooling on Electrical Coefficient of Annealed Iron, 166; Exact Thermometry, 198; the Villari Critical Points in

Nickel and Iron, 574
Topinard (Dr.), Charlotte Corday's Skull, 500

Topographical Survey of India, 140
Toronto University, Burning of, 371
Torpedo, Cranial Nerves of, J. C. Ewart, 477
Total Eclipse of January 1, 1889, Prof. Holden, 305
Total Eclipse of December 22, 1889, 229; M. A. De La Baume

Pluvinel, 428

Total Eclipse, Prof. David P. Todd, 379 Touraco, the Pigment of the, and the Tree Porcupine, Frank E. Beddard, 152

Beddard, 152
Traherne (Major John P.), the Habits of the Salmon, 74
Traill (T. W.), Boilers, Marine and Land, 486
Trains, Earth-Tremors from, H. H. Turner, 344
Trajectories of Shot, on Certain Approximate Formulæ for Calculating the, Prof. J. C. Adams, 258
Transliteration, a Uniform System of Russian, 396; Chas. E. Groves, F.R.S., 534; W. F. Kirby, 535
Trautweiler (Herr), Proposed Jungfrau Railway, 303
Travels in France, Arthur Young, 294
Travels in India of Jean Baptiste Tavernier, Baron of Aubonne, translated by Dr. V. Ball, F.R.S., 313
Tree Porcupine, the Pigment of the, Frank E. Beddard, 152
Trees growing in an Inverted Position, Herr Kny, 86

Trees growing in an Inverted Position, Herr Kny, 86

Trichosanthes palmata, a New Green Vegetable Colouring
Matter, C. Michie Smith, 573

Trieste, Earthquake at, 519

Trivier (Captain), Arrival at Mozambique of, 165

Troglodytic Remains in Jerusalem, Herr Schick, 284 Tropical Diseases, the Relation of the Soil to, A. Ernest Roberts, 31
Trotter (A. B.): Geometrical Construction of Direct-Reading

Scales for Reflecting Galvanometers, 478; Parallel Motion suitable for Recording Instruments, 478
Trouton (Fred. T.), Multiple Resonance obtained in Hertz's

Vibrators, 295 Tschermak (G.), Die mikroskopische Beschaffenheit der Meteoriten erläutert durch photographische Abbildungen, 127

Tuning-Forks: a Method of Driving, Electrically, W. G. Gregory, 47; the Testing of, Dr. Lehmann, 383

Tunzelmann (G. W. de), Electricity in Modern Life, 561

Turacin, Solubility of, in Pure Water, Frank E. Beddard, 152

Turkestan, Earthquakes in, 230

Turkeys, Brush-, on the smaller Islands North of Celebes, Dr. A. B. Meyer, 514
Turnbull (Robert), Index of British Plants, 196
Turner (A. E.), Compounds of Phenanthraquinones with Metallic

Salts, 191 Turner (H. H.): Total Solar Eclipse of 1886, 88; Earth Tremors from Trains, 344
Twenty Years, Progress of NATURE during, 1
Tylor (Dr. E. B., F.R.S.), Explanation of Assyrian Sculptured

Group, 283

Typhus and Ground-water Variations, the Hamburg Epidemic,

Tyrol, Earthquakes in the, 569

Ungulates, the Titanotherium in the British Museum, 346 Unio, Tasmanian, Variability of, R. M. Johnston, 303

United States: Fishery Industries of the, George 178; Meteorology in, 231; Land Grants to Educational Institutions in, 448; Earthquakes in, 569
University, Burning of Toronto, 371
University Extension Journal, 325

University, Helsingfors, 400

University Intelligence, 23, 92, 140, 166, 212, 332, 357 University, Johns Hopkins, 448 University, Montpellier, Proposed Commemoration of Founding

of. 447 University, the Proposed Reconstitution of London, 282, 348

University of St. Andrews, £100,000 Bequest to, 41 Upham (Wm.), the late Prof. H. C. Lewis, 255 Urea, on Animal Heat and the Combustion of, Berthelot and

Ursæ Majoris, on the Spectrum of & Prof. Pickering, 285

Vaccination, History and Pathology of, E. M. Crookshank, Dr. Robert Cory, 486 Vade Mecum, J. C. Houzeau, 69

Vandalism in Egypt, 447
Vandalism in Egypt, 447
Variable Stars: Y Cygni, 88; New, in Hydra, 88; Period of U Coronee, S. C. Chandler, 163; Variable Star in Cluster G.C. 3636, Prof. Pickering, 183; Observations of some Suspected, Rev. John G. Hagen, 233; Variability of R Vulpeculæ, 257; New Variable Star in Cælum, 571; Prof. Pickering 571

Pickering, 571
Pickering, 571
Ariation, Causes of, E. D. Cope on the, Prof. E. Ray Lan-Variation, Causes of, E. kester, F.R.S., 128 Vatican Observatory, 472

Vautier (M.), Propagation of Sound, 359 Vegetable Colouring matter, a New Green, C. Michie Smith,

573 Velocity of the Propagation of Gravitation, J. Van Hepperger,

Venn (Dr. John, F.R.S.), Cambridge Anthropometry, 450 Venus (Dr. K. E.), Death of, 207 Verescz's Discovery as to Photographing in Natural Colours,

Vertebrate Animals of Leicestershire and Rutland, Montagu Browne, 220

Vesuvius in 1889, Prof. Palmieri, 18 Vesuvius, Mount, J. Logan Lobley, 195 Vèzes (M.): Double Nitrites of Ruthenium and Potassium, 23;

A Nitrosoplatinichloride, 576
Vibrating Strings, Melde's, Rev. W. Sidgreaves, 355
Vibration, Microseismic, of the Earth's Crust, Prof. G. H. Darwin, F.R.S., 248
Vice (1884), Identity of Comet, with Brooks's (1889), 233
Victoria Falls, Matabele Land and the, Frank Oates, R. Bowdler

Sharpe, 169 Victoria Hall and Morley Memorial College, 343

Victoria, Minor Planet (12), Dr. Gill, 139 Victoria, Report of Bendigo School of Mines, 209 Vidal (Mr.), Mortality from Snake-bite in Ratnagherry District,

325 Vidal (M. Sebastien), Death of, 348 Viking Age, the, Paul B. Du Chailiu, 173 Villari Critical Points in Nickel and Iron, the, Herbert Tomlin-

Villari Critical Points in Nicket and Iron, the, Herbert Foliamsson, F.R.S., 574
Vilmorin (H. de), Salad Plants, 494
Vincent and Delachanal, Sorbite, 23
Vines (Dr. Sydney H., F.R.S.), and Prof. A. Weismann's Theory of Heredity, 317, 373, 439
Vins, Manuel de l'Analyse des, Ernest Barillot, 510
Vinla (M.), Propagation of Saund, 250

W

W

Vision (M.), Propagation of Sound, 359
Virchow (Dr.), the Spiracle Gill of Selachians, 119
Vision, Electrical Radiation from Conducting Spheres, an
Electric Eye, and a Suggestion Regarding, Prof. Oliver J.

Lodge, F. R.S., 462 Vision, Testing for Practical Purposes, Brudenell Carter, 302 Visualized I. rages Produced by Music, Geo. E. Newton, 417

Viticulture, Congress for, at Rome, 426 Vogel (Prof.), Spectroscopic Observations of Algol, 285 Voice Figures, Mrs. Watts Hughes, 42

Volcanoes: Great Eruption in Japan, 400; Notes on a Recent Volcanic Island in the Pacific, Captain W. J. L. Wharton, F.R.S., 276; Volcanic Rocks of Caernarvonshire, Alfred

Harker, 414; Vesuvius in 1889, Prof. Palmieri, 18; Geo-Harker, 414; Vesuvius in 1889, Prof. Palmieri, 18; Geological Excursion to the Active and Extinct Volcanoes of Southern Italy, 133; Activity of Queccia de Salsa, 181; the Catastrophe of Kantzorik, Armenia, F. M. Corpi, 190; the Mount Bandai (Japan) Eruption, 348; the Period of the Long Sea-Waves of Krakatão, James C. McConnell, 392; the Eruption of Popocatepetl, 592
Vulpeculæ, R, Variability of, 257
Vyestnik Estestvoznaniya, New Russian Natural Science Review 45

view. 460

Wada (J.): Earthquake of July 28, 1889, at Kiushiu, 23; Cyclone of September 11-12, 1889, in Japan, 208; Meteorology in Japan, 1887, 400

Wagner (Dr.): Behaviour of Water in Soil, 383; Fire-damp Explosions in Mines in Relationship to Cosmic and Meteoro-

logical Conditions, 504

Walford (E. A.), Terraced Hill Slopes of the Midlands, 325 Walker (Alfred O.), Foreign Substances attached to Crabs,

Walker (General J. T., R.E., F.R.S.), Unit of Length of Sir G. Shuckburgh's Standard Scale, 381 Wallace (Dr. Alfred R.): Protective Coloration of Eggs, 53;

Degree of D.C.L. Conferred on, at Oxford, 84; for Degree

D.C.L., Prof. J. Bryce's Speech on Presentation of, 112; some Notes on his "Darwinism," T. D. A. Cockerell, 393 Wallace (Prof.), Sheep Farming in Australia, 113 Waller (Dr. Aug.), Electrical Negative Variation of Heart ac-

companying Pulse, 288 Walls, Training, in Mersey Estuary, Effects of, L. F. V. Har-

court, 380 Walsingham (Lord), Presidential Address to the Entomological

Society, 334 Wapiti Acclimatized in Russia, 546

Warburton (Major P. E.), Death and Obituary Notice of, 164
Ward (Prof. H. Marshall, F.R.S.): Tubercles on Roots of
Leguminous Plants, 140; Diseases of Plants, 436
Warren (Rev. Isaac), Table and Formula Book, 558

Warren (Rev. Isaac), Table and Formula Book, 558
Watanabe (M.), Redetermination of Longitude in Tokio, 427
Water, Compressibility of, Prof. Tait, 361
Water, Effect of Oil on Disturbed, Richard Beynon, 205
Water, a General Formula for the Uniform Flow of, in Rivers

and other Channels, E. Ganguillet and W. R. Kutter, 411 Water, Physical Properties of, Prof. P. G. Tait, 416; Prof. Arthur W. Rücker, F.R.S., 416
Waterhouse (F. H.), Index Generum Avium, R. Bowdler

Sharpe, 169

Waterhouse (Colonel J.), Photography of Red End of Spectrum,

Waterhouse and Thuiller's Conversion Tables for Metric System, 65

Waterspout in Atlantic, 470 Watt (James), Proposed Memorial to, 160

Waves, the Production of, Prof. von Helmhol'z on, 95

Wayside Sketches, F. Edward Hulme, 270 Weasel, the Cape, E. B. Titchener, 394 Weather Forecasting, 278 Weather, Influenza and, Mitchell and Buchan, 596

Weather in January, Chas. Harding, 425 Weather and Tidal Forecasts for 1899, D. Dewar's, 546

Weeds, European, in America, 18 Weigert's (Dr.), Treatment of Pulmonary Phthisis, Prof.

Weismann's (Prof.) Essays, Dr. St. George Mivart, F.R.S., 38
Weismann's (Prof.) Essays, Dr. St. George Mivart, F.R.S., 38
Weismann versus Lamarck, Prof. E. D. Cope, 79
Weismann (Prof. A.): Theory of Heredity, 317, 373, 439; and
the Theory of Panmixia, 437
Weiss (F. Ernest), Foreign Substances Attached to Crabs,

Weldon (W. F. R.), Abnormal Shoots of Ivy, 464
Wesley (W. H.), the Corona of 1889 December 22, 450
West Indies, African Monkeys in the, Dr. P. L. Sclater,

F.R.S, 368

Westphalia, Stalactite Cave discovered in, 113 Wethered (E.), Occurrence of Girvanella Genus, and on Oolitic

Structure, 238 Wetterhan (D.): Galls, 131; a Formula in the Theory of Least

Squares, 394 Weyl (Dr., Biology of Anaërobic Bacteria, 359 Whales, Time they can remain under Water, 66

Wharton (Captain W. J. L., F.R.S.): Notes on a Recent Vol-canic Island in the Pacific, 276; Self-Colonization of Coco-

nut Palm, 585 Wheat, Field Experiments on, in Italy, Prof. Giglioli, 404 Whipple (G. M.), Photography in Relation to Meteorological

Work, 503 Whitaker (W.), a Deep Channel of Drift in the Valley of the

White (Robert B.), Shining Night-Clouds, 369 White (William), British Earthquakes, 202

White (William), British Earthquakes, 202
Whitechapel, Proposed Free Library at, 161
Whitham (Jay M.), Steam-Engine Design, 29
Will (Dr.), Analysis of Carcote, Chili, Meteorite, 428
Willem (Victor), the Gizzard in Scolopendridæ, 237
Williams (F. N.): Enumeratio Specierum Varietatumque

Williams (F. N.): Enumeratio Specierum Varietatumque Generis Dianthus, 51; Notes on the Pinks of Western

Europe, 78 Williams (R. P.) and B. P. Lascelles, Introduction to Chemical Science, 128

Williamson (Prof. W. C., F.R.S.): Organization of Fossil Plants of Coal-Measures, 573 Willoughby (Captain Sir John C.), Africa and its Big Game,

298 Wilson (Sir Daniel), on the Recent Toronto Meeting of the

American Association for the Advancement of Science, 17

Wilson (J. Spottiswoode), Geological Mechanism, 390 Wilson (R. W.), Magnetism in Brick Buildings, 405 Wilson (William), Practical Observations on Agricultural Grasses and other Pasture Plants, 196

Wilson (Woodrow), the State, Elements of Historical and Prac-

tical Politics, 196
Wilson-Barker (Captain David), Foreign Substances attached to Crabs, 297 Wimshurst Machine and Hertz's Vibrator, T. A. Garrett and

W. Lucas, 515 Wind, Preponderance of North-East Wind during past Five

Years, C. L. Prince, 470 Wind at Summit of Eiffel Tower, Mean Hourly Velocity of,

A. Angot, 67 Wind-velocity at top of Eissel Tower, Angot, 48

Winds, Dependence of Force of, upon Surface over which they

blow, Dr. Van Bebber, 372
Winds, a Popular Treatise on the, William Ferrel, 124
Winds, Relative Prevalence of North-East and South-West,

William Ellis, 586
Winlock (Prof.), Progress of Astronomy in 1886, 374
Winnecke's Periodical Comet, the Orbit of, M. H. Faye, 94

Winnecke's Periodical Comet, the Orbit of, M. H. Faye, 94
Wolves and Bears in Bosnia, 325
Wolves, &c., in Germany, Dr. Lampert, 182
Wood (Rev. J. G.), the Brook and its Banks, 53; the Zoo, 53
Woodall (Herbert J.), How not to Teach Geometry, 60
Woodford (C. M.): Further Explorations of Solomon Islands, 403; a Naturalist among the Head-hunters, 582
Woodthorpe (Colonel), the Aka Expedition of 1883, 86
Woodthorpe (Colonel), the Aka Expedition of 1883, 86

Woodward (A. S.), some British Jurassic Fish-remains, 310 World, Library Reference Atlas of the, John Bartholomew, 413 Worthington (Prof. A. M.), Bourdon's Pressure-Gauge, 296, 517 Wright (M. R.), Elementary Physics, 78 Wrightson (Prof. John): Sources of Nitrogen in Soils, 286; How to know Grasses by their Leaves, by A. N. M'Alpine,

Wynne (W. P.), Constitution of Tri-derivatives of Naphthalene, 454

Yatchevsky (M.), Limits of Ever-frozen Soil in Siberia, 472 Yeast, Fermentation with Pure, Prof. Percy F. Frankland, 339 Yeast, Fermentation with Pure, Prof. Percy F. Frankland Young (Arthur), Travels in France, 294 Young (Prof. C. A.), the Elements of Astronomy, 485 Young (Dr. Sydney), Exact Thermometry, 152, 271, 488 Yule (Sir Henry), Death of, 207

Zeiss's New Apochromatic Microscope Objective, 494 Zelbr (Dr.), Comet Swift (f 1889, November 17), 115, 233 Zepharovich (Ritter von), Death and Obituary Notice of, 448 Zodiacal Light, Maxwell Hall on the Spectrum of the, 351, 402 Zodiacal Light, J. Norman Lockyer, F.R.S., on, 402 Zoo, the, Rev. J. G. Wood, 53 Zoogeography: Wolves, &c., in Germany, Dr. Lampert, 182 Zoological Discoveries, N. M. Przewalsky's, 468

Zoological Floating Station at Isefiord, Denmark, 569
Zoological Gardens, Additions to, 44, 68, 87, 114, 138, 163, 210, 232, 256, 284, 304, 326, 349, 402, 449, 472, 496, 521, 548, 571, 595
Zoological Society, 94, 143, 335, 382, 406, 478, 550, 575, 599
Zoological Results of the Challenger Expedition, 217
Zoology: Who Discovered the Teeth in Ornithorhynchus?, C. Hart Merriam, 11, 151; Prof. W. H. Flower, F. R.S., 30, 151; Prof. Oswald H. Latter, 30, 174; the Old English Black

Rat in Cornwall, Thos. Cornish, 161; Snake and Fish, Herr Fischer-Sigwart, 162; Arrangement of Excitable Fibres of Internal Capsules of Bonnet Monkey, Beevor and Horsley, 166; Heloderma suspectum, the Poisonous Lizard of South-West United States, the Craniology of, R. W. Shufeldt, 181; a Milk Dentition in Orycteropus, O. Thomas, 309; the Catalogue of the Indian Museum, 594
Zsigmondy (Dr. Emil), his Alpine Expeditions, 291
Zwardmaaker (Dr.), Olfactometer, 349

